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ONLY EIGHTY-FIVE AMERICAN SHIPS LEFT

The word ship is used loosely by laymen to designate any sort of craft. To the man in the street anything from

Arthur Sewall & Co., of Bath, Me., built the Atlas for the Standard Oil Co. There was a time not long since when the American square-rigger was the pride of the seas and when the



ONLY EIGHTY-FIVE OF THEM LEFT.

a steamer to a schooner is a ship; but strictly speaking the ship is the square rigger and no other.

On Jan. 1, 1870, the United States had 2,295 ships or square rigged vessels. Today it has only eighty-five, of which seventy-five are American built and ten are foreign built. No square rigger has been built in the United States since 1902, when

export trade of the United States was carried in them to all quarters of the world. Various conditions have operated, however, to cause their general abandonment. The square-rigger is declining steadily throughout the world, except in France where high bounty is given to them. A square-rigger of a given carrying capacity requires more

than double the crew of a schooner of equal carrying capacity. A schooner of 5,000 tons carrying capacity can be handled quite readily by a crew of sixteen men, but a square-rigger of that capacity would require thirty-six men. It is therefore clear that a square-rigger is not an economical carrier. A ship, however, is a thing of beauty and it is to be regretted that the necessities of trade are driving it out of business. As a matter of historical record there is printed herewith a list of all the American sailing ships that are left, the remnant of a beautiful fleet that once covered every sea with their clouds of canvas.

Ships.	Gross Tons.	Built.	Ships.	Gross Tons.	Built.	
A. G. Ropes.....	2460	1884	Sea Witch	San Francisco	1535	1876
A. J. Fuller.....	1848	1881	Bark	San Francisco	1289	1872
Abner Coburn.....	1972	1882	Shenandoah	Bath	3406	1890
Acme	3288	1901	Sintram	San Francisco	1656	1877
Agenor	1487	1870	Spartan	San Francisco	1448	1874
Alexander Gibson ...	2194	1877	Standard	San Francisco	1534	1878
America	2054	1874	Star of France	Port Townsend	1644	1877
Arthur Sewall	3209	1899	Star of Italy	Port Townsend	1613	1877
Aryan	2123	1893	Star of Russia	San Francisco	1981	1874
Astral	3292	1901	Susquehanna	Bath	2744	1891
Atlas	3381	1902	Tacoma	San Francisco	1738	1881
Baleclutha	1716	1886*	Tillie E. Starbuck	San Francisco	2025	1883
Bangalore	1743	1886	Two Brothers	San Francisco	1382	1868
Benjamin F. Packard.	2156	1883	W. F. Babcock	Bath	2130	1882
Berlin	1634	1882	William H. Macy	San Francisco	2202	1883
Bohemia	1633	1875	William H. Smith	San Francisco	1978	1883
C. F. Sargent	1704	1874	William P. Frye	Bath	3374	1901
Centennial	1286	1875	Jacob A. Stamber	New York	1198	1856
Charles E. Moody	2003	1882				
Columbia	1471	1871				
Dirigo	3004	1894				
E. B. Sutton	1826	1881				
Eclipse	1594	1878				
Edward Sewall	3206	1899				
Elwell	1461	1875				
Emily Reed	1564	1880				
Erskine M. Phelps	1317	1880				
Falls of Clyde	2998	1898				
Fort George	1809	1878				
Bark	1769	1884				
Glory of the Seas	1837	1884				
Governor Robie	2102	1869				
Great Admiral	1712	1883				
Harvard	1575	1869				
Hawaiian Isles	1603	1884				
Hecla	2148	1892				
Henry Failing	1529	1877				
Henry Villard	1976	1882				
I. F. Chapman	1552	1882				
Indiana	2145	1882				
Invincible	1487	1876				
Jabez Howes	1460	1873				
James Drummond	1648	1897				
John Currier	1556	1881				
John Ena	1945	1882				
John A. Briggs	2842	1892				
Joseph B. Thomas	2110	1878				
Kenilworth	1938	1881				
Kennebec	2293	1887				
Llewellyn J. Morse	2126	1883				
Lucile	1392	1877				
Luzon	1402	1874				
M. P. Grace	1390	1881				
McLaurin	1928	1875				
Manual Llaguno	1374	1879				
Marion Chilcott	1732	1879				
Occidental	1737	1882				
Oriental	1533	1874				
Paramita	1688	1874				
Paul Revere	1582	1879				
Reuce	1735	1876				
Roanoke	1924	1881				
S. D. Carleton	3539	1892				
S. P. Hitchcock	1882	1890				
St. David	2305	1883				
St. Frances	1595	1877				
St. Nicholas	1898	1882				
St. Paul	1798	1869				
Santa Clara	1893	1874				

*See page 190 of Report of Commissioner of Navigation for 1904.

LARGEST VESSEL AFLOAT

The Kaiserin Auguste Victoria, which was successfully launched at the Vulcan Ship Building Works, on the Oder recently, in the presence of the Kaiser and Kaiserin and a distinguished company of German naval officials, is a sister ship of the Amerika, which was built by Messrs. Harland & Wolff only last April. These vessels are the latest and most noteworthy additions to the Transatlantic fleet of the Hamburg-American line. The Kaiserin, like her companion, will be engaged in passenger traffic between New York, Plymouth, and Cherbourg, and her size, speed, and equipment will no doubt make her a serious rival among the Atlantic ferry-boats. She is slightly larger than the Amerika. Her length is 700 ft.; beam, 77 ft.; depth, 54 ft., or 87 ft. from boat deck to keel; speed, about 18 knots; engines, 17,200 H. P.; displacement, 42,500 tons; tonnage, 25,000. In comparison with our Leviathan, the Baltic, the Kaiserin Auguste Victoria is 25 ft. shorter, but her fuller lines give her about the same displacement. In gross tonnage the new vessel will excel the Baltic by 1,000 tons; she will have less capacity for cargo but more for passengers. The Kaiserin will have three open decks, and an electric lift will convey passengers from the saloon deck to the upper promenade deck. She will accommodate 550 first-class passengers, 300 second-class, 250 third-class, 2,300 fourth-class—a grand total of 3,400 passengers. Her crew, all told, will number 600. A novel arrangement on this ship, which will be understood and appreciated by not a few, will be a restaurant, where passengers may have meals *a la carte*. Such voyagers would only pay the bare passage money when buying their tickets.

The vessel received her name at the hands of the empress, and took the water without a hitch. Contrary to expectations the emperor made no public speech, and their majesties returned to Berlin in the afternoon. It is believed that after the launch a conference of the directors of the Vulcan company was held on the proposal to build and equip a new yard on the Elbe at a cost of about £500,000.

The steamship Minnesota of the Great Northern line, recently completed her best run eastward across the Pacific, making the trip from Seattle to Yokohama in 13 days, 6 hours, at an average of 13.46 knots per hour, inclusive of the time lost on Puget Sound. On her previous trip the Minnesota made the run to Yokohama in 14 days, 12 hours. On her last home trip the Minnesota reached Port Townsend in 11 days 23 hours, actual speed. Upon this trip she negotiated the straits at the rate of 15 knots per hour.

The board of public improvements of St. Louis will open bids on Oct. 3 for the construction of a steel hull harbor boat. The assembly appropriated \$35,000 for the construction of the boat.

LIVERPOOL SHIPPING LETTER

Liverpool, Sept. 11.—Readers of the *Marine Review* who are exerting themselves toward developing the mercantile marine of the United States will read with interest the following tabular comparison of 63 years of British and Foreign shipping in British ports taken from the official report of the Committee on Foreign Ships which has been inquiring into the statutory requirements necessary for the protection of British shipping.

"Tonnage of vessels (sailing and steam) entered and cleared with cargoes and in ballast at ports in the United Kingdom from and to foreign countries and British possessions."

IN MILLION TONS.

Year.	British.	Foreign.	Total.
1840	6.49	2.94	9.43
1841	6.79	2.62	9.41
1842	6.66	2.45	9.12
1843	7.18	2.64	9.82
1844	7.50	2.84	10.34
1845	8.54	3.53	12.07
1846	8.68	3.72	12.41
1847	9.71	4.56	14.27
1848	9.28	4.01	13.30
1849	9.66	4.33	14.00
1850	9.44	5.06	14.50
1851	9.82	6.15	15.98
1852	9.98	6.14	16.13
1853	10.26	8.12	18.39
1854	10.74	7.92	18.66
1855	10.91	7.56	18.48
1856	12.94	8.64	21.58
1857	13.69	9.48	23.17
1858	12.89	9.41	22.30
1859	13.31	9.59	22.90
1860	13.91	10.77	24.68
1861	15.42	11.17	26.59
1862	15.94	10.58	26.53
1863	17.01	9.71	26.73
1864	18.20	9.00	27.20
1865	19.35	9.53	28.89
1866	21.25	10.00	31.26
1867	22.37	10.38	32.75
1868	22.66	11.02	33.68
1869	23.78	11.12	34.91
1870	25.07	11.56	36.64
1871	28.03	13.51	41.45
1872	28.71	13.78	42.50
1873	29.64	14.79	44.43
1874	30.08	15.33	45.42
1875	30.94	15.33	46.27
1876	33.44	17.34	50.78
1877	34.76	16.76	51.53
1878	35.29	16.30	51.59
1879	37.43	15.28	52.71
1880	41.34	17.38	58.73
1881	41.54	16.40	57.94
1882	43.67	17.82	61.49
1883	47.03	17.92	64.96
1884	46.67	17.60	64.27
1885	46.38	17.89	64.28
1886	46.07	16.76	62.84
1887	47.94	17.21	65.16
1888	50.39	18.12	68.51
1889	52.46	19.42	71.88
1890	53.97	20.31	74.28
1891	53.95	20.85	74.81
1892	54.37	21.49	75.86
1893	54.14	20.48	74.61
1894	58.67	21.84	80.52
1895	58.68	21.84	80.53
1896	62.06	23.39	85.45
1897	64.42	25.77	90.19
1898	64.20	26.73	90.95
1899	65.64	32.13	97.77
1900	62.70	35.80	98.52
1901	62.78	34.55	97.34
1902	64.90	34.96	99.87
1903	69.20	36.40	105.61

While on the subject of Britain's foreign shipping trade, it may be interesting to add that the total tonnage entered

with cargoes during August this year was 3,726,451 tons, of which 2,502,690 tons were British, and 1,223,761 foreign, an increase of but 6,586 tons on the figures for August last year. The tonnage cleared with cargoes during this period was 4,366,634 tons, of which 2,941,527 tons were British and 1,425,107 tons foreign, the total showing an increase of 173,420 tons over the corresponding period of 1904.

The North Atlantic passenger conference has dropped up again this week by the three months notice having expired which was given by certain lines to withdraw from the understanding that has hitherto existed. The North Atlantic Conference may now be said to be non-existent. It has long been felt that the conference could no longer be advantageously maintained owing to the respective positions taken up some time ago by the White Star and Cunard lines. Neither would give way and the main purpose of the conference having been thwarted by the difference between the two principal lines, its operations have been practically nullified. Still the conference agreement is being kept, but it is open for any to vary its classification of steamers and rates without reference to any other company engaged in the traffic. It is however said that there is a tacit understanding not in any way to interfere with the basis of the conference procedure as regards passenger fares, a policy that has perhaps been dictated by strong financial reasons. The last rate war entailed such fearful losses that it may readily be imagined that no individual Atlantic line would hazard the adoption of a policy which might bring retaliation on the part of others. Perhaps before the next season opens, the conference will be revived either on the old or modified lines.

The building of the Dreadnought, the only British battleship that is provided for in this year's naval estimates, is to be commenced at Portsmouth on Oct. 2, and her construction will constitute a record in British naval shipbuilding. Orders have been given that she is to be launched in February, or five months after the laying of her first keel plate, and she is to be in all respects ready for sea within 16 months. The battleship is to have a displacement of 18,000 tons, and she will carry ten 12-in. guns in barbettes. The ship is to be fitted with turbine engines and will be the most powerful war vessel afloat. Already some hundreds of tons of material are in readiness and over a dozen big derricks are in position ready to lift the great armor plates and drop them in the places already marked for them. As a defense against submarines, her armor plating will be of a special character. It is to run the whole length of the ship, and also considerably below the water line, while, in addition, as a guard against torpedo explosion, which the battle of the Sea of Japan showed to be vital to any ship, the double bottom is to be specially strengthened.

It is announced that the Hamburg-American Line will this month inaugurate a new steamship line for passengers to the Far East. Five new steamers will be employed in the service, and they will call at Port Said, Singapore, Hong Kong, Shanghai, Tsingtan, Yokohama and Kobe. The first vessels to sail are the Rhaetia, and the Rugia, and the other vessels will follow at monthly intervals.

The German government has now agreed to be represented at the Brussels diplomatic conference on maritime law. This adhesion, following the British acceptance, will mean that the conference will include plenipotentiaries of all nations of any maritime importance, seeing that the United States, France, Italy, Belgium, Sweden and Norway, Russia, Japan, etc., were already represented. The great importance of the conference is that it is an official meeting of plenipotentiaries of the various countries fol-

lowing the conference of lawyers, shipowners and underwriters convened by the International Maritime Committee, and with the object of considering the means for introducing into the laws of the various states draft treaties on collision and salvage at sea.

The official announcement is made by the Suez Canal Co., that the transit rates are to be reduced from the first of January next from 8f. 50c. to 7f. 75c. per ton, while the draught allowed to ships using the canal is to be increased from 26 ft. 3 in. to 27 ft. It is gratifying that the Canal Directorate have at last recognized the justice of the British shipowners' complaint that the dues charged have been unduly high, and the present concession, although not all that might be yielded, is accepted as a step in the right direction.

Peace having been declared between Russia and Japan, there is no little speculation as to the activity which will ensue in British shipbuilding circles, and the orders that may come from one or both these countries for new tonnage. The British shipbuilding industry is undoubtedly reviving if the reports from the various centers indicate anything, and the prospect of orders from either Russia or Japan will add confidence in the present position. The demand for steel plates affords an unerring indication of the state of the shipbuilding trade and that demand has not been so brisk for a long time as it has been during July and August. This demand for shipbuilding material is, naturally, stimulating the iron trade, and the important order for hematite booked from the United States of 25,000 tons, has acted as a further stimulus, and this is probably not the last of its kind which will be given considering the "boom" which has lately developed in the American steel trade. Such an order is not only good for the iron trade, but also for the shipping trade, for 25,000 tons will mean outward freight for at least half a dozen large steamers.

Sir Christopher Furness, the well known shipowner and shipbuilder accompanied by several British members of Parliament have just completed a tour of the French, German, Belgium and Dutch ports, undertaken with the object of observing the facilities compared with British ports for the economical and rapid handling of cargoes, particularly for large steamers. Sir Christopher expresses himself as being greatly impressed with the advantages arising from the quick handling of cargoes in the ports named compared with the old-fashioned methods now existing in the port of London. These improvements are especially due to the use of motor barges. Sir Christopher computes that from three to four thousand of these barges are in use in Dutch and Belgian ports alone, while not a single one is actually in use in the port of London. In view of the discussion which is about to ensue in the British Parliament on the bill for the improvement of the port of London, some extremely interesting results may be expected as the outcome of the tour.

It is significant, says the *Glasgow Herald* of the progressive attitude of the technical officers of the Admiralty, especially in the engineering branch, that they have decided to apply experimental gas engines with producers instead of steam engines and boilers for the propulsion of large vessels before any shipowner was found with courage to essay a departure, although experience in land stations promises most economical results. An installation now being constructed at Manchester, will be applied by the Admiralty, and as the power to be developed is 500 I. H. P., it will be recognized that the test is to be on a thoroughly practical and searching scale, while thus giving credit to the Admiralty, it is but fair to make mention of the splendid pioneer work carried out, and being con-

tinued, by Mr. William Beardmore of Glasgow, in this respect, alike for marine and land work. It is now some years since Mr. Beardmore took up the work, acquiring the British rights in the Ochelhauser engine, one of the simplest and most popular of the continental designs. The success of the application of this horizontal engine, several of which are now in use in the west of Scotland led him to investigate fully the adaptability of the system to marine work, and now there is being built a 500 H. P. and a 1,000 H. P. installation for ships, and these may be ready before the Admiralty sit. Mr. Beardmore, however, has had to accept all responsibility for the installations. They will be fitted in existing steamers, and unless the new installation proves more economical in every respect than the old engines in working over a considerable period, the new machinery will have to be taken out, and the old engines replaced. An effort is to be made to use the cheapest bituminous coal for the generation of the gas for the engines, and there seems every chance of success, with a satisfactory method of purifying the gas to prevent clogging of valves, etc. Should this be realized, and the consumption come out under one pound per H. P. per hour, the coal bill will be halved, and at the same time more room made available for cargo by the reduction of the size of engine rooms, stokeholds and coal bunkers.

WRECK OF THE SEVONA

The New York Times has the following to say concerning the dangers of navigation on the great lakes with especial reference to the wreck of the *Sevona*. It is one of the few sensible things that Eastern papers say occasionally regarding lake navigation:

"Salt water sailors are apt to speak with a derision not always mild of their brothers on the Great Lakes, and of course the two branches of the nautical family do differ in many respects. The men of the oceans should remember, however, that the navigators of the lakes have not in some storms, but in every one they encounter, a lee shore close at hand, a circumstance well calculated to develop seamen of no little skill and courage. That in itself ought to inspire caution in criticising fresh-water sailors, while it needs only the reading of the story we printed yesterday about the wreck of the *Sevona* to prove that the heroic self-sacrifices that make such glorious passages in sea history have been equaled—very far from the first time—on the lakes; that while the lakes may not have as many traditions as the sea, the men who sail them can live up to the very best standards of conduct set for the mariner. Driven on the rocks, and rapidly pounding to pieces by the icy waves of Lake Superior, the captain, officers, and crew of the *Sevona* showed no trace of panic, but calmly prepared to save their passengers if possible. There were not enough boats for all on board, and the captain's call for volunteers to remain behind was answered by so many of his men that he was forced to use some sternness in driving enough of them to the other duty with the chance of safety that lay in trying to get the passengers to land. That the captain himself stayed is almost a matter of course, but that the others were so eager to share his fatal honors is not a matter of course on salt water any more than on fresh. The wreck of the *Sevona* will, or should, take its place among the disasters that are redeemed of their horror by the devotion of their victims to the highest of ideals."

The administration of the North German Lloyd reports a profit for the first half of 1905 of \$1,750,000.

AS BUFFALO VIEWS THE SITUATION

Buffalo, Sept. 19.—There is satisfaction as well as safety in estimates, even if they do not come so very near the actual achievement. We are dealing in large figures now in lake matters, figures very far removed from the really recent day when the skipper was master of a canal schooner, having a carrying capacity of not over 600 tons and whose crew was mainly made up of his own family and who often had no other home. He merely did his best and was obliged to live on his earnings. There were no dividends then and usually there was no debt, no bonds to float or to meet when they came due, though there was commonly profit enough to make it possible for him to borrow money if he needed it suddenly to make up for an accident.

Speculating across from the small to the large it is pleasant to find now that there are owners who feel that the limit of size has been reached and that more capacity now means more expense and possibly quite as much more as the added earnings will cover. They figure that a steamer that will carry 10,000 tons of ore will burn about two tons of coal an hour and that the crew of about 24 men must be paid about as much as the coal costs, not to mention the cost of food and supplies. Interest and insurance about double the other cost, not to mention depreciation, which is something, though we have not yet discovered what is the life of a steel bottom.

So it may loosely be estimated that a 500-footer costs \$2,500 a trip of ten days and if she makes the trip in that time she ought to net a matter of \$3,000 a trip. She will have to be well handled to do that and likely have a dock of her own at the lower end to save her from the delays that are the eaters up of profits far more than the accidents are as a rule. If the trip is prolonged to twenty days the earnings are cut down almost to nothing so that it is the quick dock instead of the quick boat that tells the story. On this account the uniting of interests is a point of great account.

They say that the reason that the docks in the inner harbor of Buffalo do not show the improvement they should is that they do not belong to the vessel owner, except in case of package freight, while outside, and notably in case of the Buffalo & Susquehanna furnace, there is more than one interest asking for up-to-date docks and the matter is easy. Combination hits nobody the wrong way in this case and it will soon be the rule.

Supposing the figuring of \$3,000 a trip net is not far out of the way a 20-trip season, which is about the limit for the average steamer, will lay down an earning of \$60,000, which is a big amount for a single season and would be regarded as something immense till we reflect that it must be reckoned against a first cost of at least \$300,000 and maybe considerable more, so that the actual rate of profit is not above 20 percent and it may be very much less—will be much less, unless there is a lot of hustling to make way for the steamer wherever she goes and no delays of account for accidents.

This earning is not very large when considered as about the best that is to be expected and is really small in comparison to the earning of the canal schooner of 15 years ago that was getting two cents for wheat at Toledo and 50 cents for coal back, for if the trips were not made very fast there was no coal bill and only a matter of \$4,000 or so of first cost to reckon against. It was easy to reckon big percentages then and to lay by awhile did not mean the loss of a fortune.

It is therefore, going to be very risky hereafter to build a large-size steamer and expect to do very well with her unless there is also some sort of control of either the

ore or the docks to insure a further profit on the one hand and an assurance of despatch on the other and it may soon be a big advantage to get a good string on the railway also that moves the ore from the lower-lake dock. The fact is that in almost all large divisions of transportation the business has grown so fast of late that the carrier is a genius if he has kept all the machinery moving to keep up with it, so that there is no choking up here and there to take all the profit out of the lake freighter. I am fully persuaded, for instance, that there are freight cars enough to do the business of the country without much delay, but the freight has multiplied so that the roads are swamped through not being able to evolve a car-handling system to meet the case.

We are getting good reports of the new steamer W. A. Rogers, with her own ore dock—the Buffalo & Susquehanna—to take care of her and it is said that there is no stock for sale of her successor, which is to carry about 11,000 tons to her 10,000. She is to be called the Charles A. Weston, after the head of the Weston lumber interest of Tonawanda, and will be out in the spring.

JOHN CHAMBERLIN.

A NEW TRIAL COURSE

The armored cruiser Colorado will undergo speed trials at Rockland, Me. There is a general feeling among the naval authorities that better conditions can be obtained there, for the reason that there is an average depth of sixty fathoms on the Munroe Island course, and only twenty-five on the Provincetown course. Both courses are a measured mile for the standardizing of propellers. The Munroe Island course, though laid out ten months ago, has never been used owing to the report that a dangerous shoal spot existed in or near it. For the purpose of learning the actual condition of affairs, the survey boat Explorer was sent there this summer and an exhaustive search was made for the reported ledge. Many days were spent in making the examination, with the result that the government has been informed that there is absolutely no defect in the course as laid out by the Eagle. This course is on the outer side of Munroe Island and only a short distance from the mainland at Owl's Head. The members of the naval board with the Colorado are Capt. J. H. Dayton, Capt. E. H. C. Leutze, Naval Constructor J. J. Woodward, Comd'r T. M. Potts and Comd'r I. S. K. Reeves. With them are six assistants, who are assigned to as many important duties while the trial is on. The big ships soon to have their trials are the Virginia, St. Louis and Connecticut, while the New Jersey and Rhode Island are approaching completion.

QUARANTINE VESSEL PURCHASED

The need of a boat to be used exclusively as a quarantine vessel has long been felt in San Francisco. Recently the Neptune was purchased on recommendation of the secretary of the treasury. This vessel belonged to the American Towing & Lightering Co., of New York. At the end of a long trip of eighty-five days from Baltimore, the Neptune arrived very recently at San Francisco under command of Capt. McLeod. She will be used at Angel Island as a quarantine boarding boat, under the personal direction of federal officer Cumming. The long passage was made without any special incident, with good weather prevailing nearly all of the way. The Neptune was examined and went into commission at once.

At the annual dinner of the Vermont Fish & Game League last week, Secretary Leslie M. Shaw of the treasury department, spoke briefly on "Trade Expansion." He urged the exportation of American products in American vessels.



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Senator Henry Cabot Lodge in his recent speech at the Essex Club dinner urged the passage by the next congress of the bill framed by the Merchant Marine Commission to encourage shipping in the foreign trade. He especially referred to the vessel interests of New England, saying that the passage of the bill would induce investment of new capital in shipping. New England at present owns a considerable number of wooden vessels, but they are all engaged in coastwise service. Senator Lodge desires to see New England become again on the sea what it once was. There was a time not long since when the ships of New England were to be seen in every harbor in the world. Senator Lodge pointed out that the bill now before congress does not impose a direct tax upon the people. The money is to be derived from tonnage dues and to be distributed among American vessels which conform to the conditions nominated in the bill. No money is to be given away under the bill. Every penny of it must be earned in service. In his address Senator Lodge indicated his confidence that the bill would be passed. While he did not directly say so, he inferred that the opposition of certain western Republicans to the measure had been overcome. The shipping bill is not a party measure and should not be made one. It was framed upon in-

formation submitted to congress by a commission made up of both Republicans and Democrats. This bill should be passed, in that it proposes nothing radically different from what other nations are now doing. Great Britain, Germany and France aid shipping in far more direct ways than that proposed in the bill. One thing is certain—the United States will never have a merchant marine in the oversea trade until it adopts the policy of obtaining one that has been adopted by other countries.

When the Canadian fisheries cruiser Vigilant was put on the lakes it was for the express intention of overtaking any fishing craft that might be poaching in Canadian waters. During the year which she has been in commission she has pursued and captured a number of American fishing tugs, and in certain instances she has fired upon them. Of course, the original purpose in firing is merely to intimidate, the shots being usually directed across the bows of the fleeing tug. This, however, has not proved sufficient in certain instances, the tug continuing to flee and taking chance of not being hit. In a set race no fishing tug on the lakes can hope to escape the Vigilant, since her engines are of great power and she is designed for a speed much greater than that possessed by any fishing vessel.

In pursuing one tug a few months ago, the Vigilant unavoidably sank it in collision, owing to the fact that the master of the tug would not desist from his attempt to escape, but continued to maneuver until the Vigilant could no longer avoid a collision. A couple of lives were lost in this encounter. Last week the Vigilant was compelled to fire upon two more tugs. Fortunately there were no casualties.

Of course, promiscuous shooting cannot go on forever without some one getting killed. If any one is killed there can be no redress. The sensible thing to do is to desist from poaching. Moreover, from the standpoint of morality it is unfair to expect the Canadian government to be the sole defender of the treaty made between Canada and the United States. The treaty is as much the province of the United States government to defend as it is of Canada. If the Federal government would make it a point to prosecute the owners of fishing tugs caught poaching in Canadian waters, the practice would speedily stop.

An interesting comparison has been made of the performance of the steamship Dakota in her initial run from New York to Seattle, and the famous trip of the United States battleship Oregon from Pacific to Atlantic waters to join the American fleet off Cuban shores. The Oregon was seventy-nine days in making her trip, covering a distance of 14,511 knots, while the Dakota on her run from New York to Seattle required sixty days. The average speed of the Oregon and Dakota was practically the same. The Oregon had not been in dry dock for some time when she attempted her

remarkable trip, while the Dakota was fresh from the ship builders. The trip of the Hill liner was her initial voyage, and there was at the outset considerable nursing to see that she performed well. The battleship Oregon had 1,111 more horse-power than the engines of the Dakota indicate, and the warship sat lighter in the water. The Oregon made the trip through the Straits of Magellan, while the Dakota went clear around the Horn.

Possibly the most remarkable showing in the comparisons is the fact that the Dakota ran from New York to Coronel without stopping an hour for any purpose. Her propellers made 2,760,000 revolutions without a stop. The only stops made by the big liner were at Coronel for coal, and at San Francisco to discharge cargo. When the Oregon went to the Atlantic to join Sampson's fleet she put in at San Francisco, Callao, Port Tamar, Rio Janiero, Bahia and Barbados. These stops, with the detours she made to avoid contact with the Spanish fleet, increased her mileage. While the Dakota consumed much more coal than the Oregon on the run, the actual fuel cost was much less. The Oregon burned Comox, Cardiff and English coals, costing an average of \$11.96 per ton. She consumed 4,203 tons, making a total cost for the voyage of \$50,267.88. The Dakota, burning Pocohontas and Coronel coal, costing an average of \$3.27 per ton, used 7,602 tons, at an aggregate expense of \$44,858.54. The Oregon made an average of 3.48 knots per ton of coal consumed; the Dakota, 1.96 knots. The Oregon started March 6, 1898, and arrived May 24. The Dakota sailed April 28, 1905, arriving June 27. The Oregon steamed 14.511 knots; the Dakota, 14.879; the former making an average of 11.16 knots per hour and the latter 12.46. The best day's run of the Oregon was 350.4 knots, while the Dakota's best record was 350.3 knots; the Oregon's average speed per hour that day being 14.6 knots, and the Dakota's 14.596 knots.

A comparison of size and horse-power for the two boats gives an interesting showing. The Oregon's length of 348 ft.; the Dakota, 630 ft. The beams are respectively 69 ft. 3 in. and 73 ft. 6 in. The Oregon has a depth of 27 ft. 6 in.; the Dakota, 56 ft. The average displacement of the Oregon is 11,137 tons; the Dakota, 27,220. The horse-power of the battleship is 11,111, and of the Hill liner, 10,000. Respectively the average mean draught is 24 ft and 28 ft. 6 in.

CHICAGO GRAIN REPORT

Chicago, Sept. 19.—Grain freights were rather dull at the opening of week but the apparent winding up of the September corn deal developed a quick call for vessels and rates advanced to 1 $\frac{1}{4}$ to 1 $\frac{3}{8}$ cents Buffalo corn. The call, while of somewhat intermittent character, has good undertone and barring any excess of vessel offerings the new basis presages an attractive fall market. Line steamers about fully occupied in package freight handling—the flour shipments of past week aggregating some 212,000 bbls. and the lake proportion establishing the season's best record.

Shipments of the past week as reported by E. J. Fleming & Co. were distributed as follows: Via all rail lines of flour,

72,715 bbls.; wheat, 153,880 bu.; corn, 216,230 bu., and oats, 686,925 bu. Via lake to Buffalo and other American ports, of flour, 132,000 bbls.; wheat, 40,000 bu.; corn, 1,223,709 bu., and oats, 140,000 bu. And via lake to Canada points, of flour, 7,546 bbls.; corn, 182,000 bu., and oats, 418,000 bu.

Lake and Rail Shipments:

	This week.	Last week.	Same week last year.
Wheat	193,883	201,116	460,604
Corn	1,022,360	2,496,385	2,534,393
Oats	1,245,606	946,825	632,012
Rye	14,964	38,712	9,559
Barley	100,108	73,919	65,177
	3,176,921	3,756,957	3,701,745

Flour 212,421 (bbls.) 164,997 75,448

	Since Jan. 1, 1905.	Same time last year.
Wheat	9,660,859	10,489,879
Corn	69,135,901	52,121,545
Oats	38,658,141	33,003,626
Rye	751,569	888,220
Barley	2,826,754	2,966,291
	121,033,224	99,469,561

Flour 4,410,291 (bbls.) 5,320,852

Stocks of Grain in Elevators:

	This week.	Last week.	Same week last year.
Wheat	5,426,000	5,267,000	4,707,000
Corn	4,175,000	3,512,000	5,416,000
Oats	9,203,000	8,679,000	9,915,000
Rye	163,000	147,000	703,000
Barley	89,714	83,714	107,000
	19,116,714	17,688,714	20,848,000

ITEMS OF GENERAL INTEREST

Mr. W. S. Newhall, who recently resigned as chief engineer of the Wabash, is now with the McMyler Mfg. Co. of Cleveland.

The tug H. P. Abbott of the Union Tug Co., which was burned last year at Duluth, has been rebuilt and is again in commission.

The tug Seaman owned by the Crawford Tug Co., burned to the water's edge at Cape Croker near Wiarton, Ont., last week.

Howard's Ship Yard, Jeffersonville, Ind., will build a car transfer for the St. Louis Transfer Co. The transfer will have a capacity for twelve loaded cars.

The Indiana Transportation Co., Michigan City, Ind., will build a new passenger steamer to be operated between Michigan City and Chicago. The plans for the steamer, however, have not as yet been drawn.

The huge wooden dry dock built for the New Orleans Dry Dock & Ship Building Co., which has been in construction at Orange, Texas, for the past nine months has been taken to New Orleans. The dock is 242 feet long and 96 feet wide.

The steel tug Monocacy which the Maryland Steel Co. is building at Sparrow's Point, for the Philadelphia & Reading Railway Co., is nearing completion. The tug is 170 ft. over all, 163 ft. keel, 29 ft. beam and 18 ft. depth of hold. She is equipped with triple-expansion engines with cylinders 18, 28 and 45 in. diameter by 30 in. stroke, supplied with steam from two Scotch boilers, 12 ft. 1 in. diameter by 12 ft. 6 in. long. She will be used for deep-sea work between New York, Boston, Philadelphia and Providence, and is equipped with every modern convenience.

LAUNCH OF THE STANTON



MISS MARCELLA ANDREWS, SPONSOR.

every one was present and all was in readiness the Stanton went overboard a few minutes before noon. The day was perfect, the rain of the early morning having settled the dust. Miss Marcella Andrews, ten years old, broke the bottle with precision and did not even fail to pronounce the words "I christen thee John Stanton." As a rule a child has far more self-possession on these occasions than a debutante who usually fails to say anything at all.

The launching party went from Cleveland to Lorain in special cars, returning to the Clifton Club for luncheon as the guests of the American Ship Building Co. The banquet rooms were beautifully decorated for the occasion. Mr. Harvey D. Goulder acted as toastmaster.

In his introductory remarks he stated that whenever he saw a launch of the kind of the Stanton he was reminded of the story of the man in Tennessee who had \$1,500 and wanted to buy a sawmill. One of his acquaintances could not understand why any man who had \$1,500 should want a sawmill.

"It is natural that the

Each succeeding launch at the Lorain yard of the American Ship Building Co., seems to be a trifle nearer perfection than its predecessor. Probably the added experience makes it so. It would seem impossible to have a launch more perfect in every detail than the launch of the great steamer John Stanton on Saturday last. Launches are never behind time at this yard; if anything, they are a little ahead of time, and as

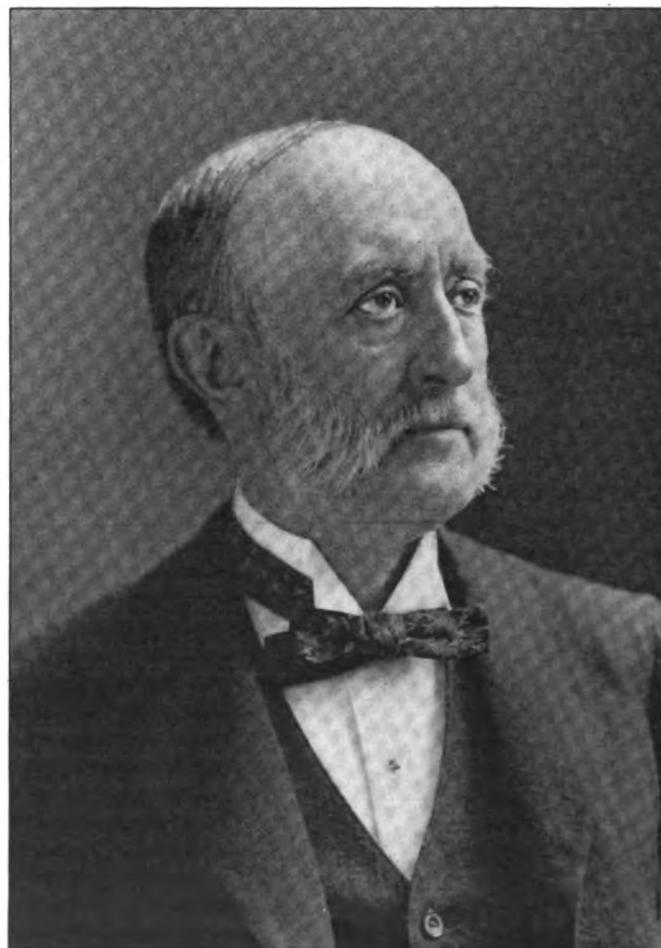
thought should occur to one as to why we should want any more ships on the lakes," said Mr. Goulder "but we must remember that no man can build ships unless they are going to be employed. Our lake trade is growing in such a manner as to absorb the new fleet. I well remember when the Joseph S. Fay came out in 1871. She was named after a noted Boston gentleman and could carry 900 tons on the draught of water then obtaining. She could carry about 9,000 tons in a season.

Now another ship has just come out, named after another noted Boston gentleman, the W. A. Paine, which can carry 9,000 tons on a single trip. In 1871 the Lake Superior country supplied the ore for 14 percent of the pig iron manufactured in this country. During the present year 80 percent of our pig iron will be made out of Lake Superior ores. In 1871 we brought down 12,500,000 bushels of grain. Last year we brought down 294,000,000 bushels of grain and this year we will bring down even more. It is a splendid panorama of progress that we are witnessing. But don't think that we can have prosperity unless there is a demand for products somewhere. What we do on the lakes is merely an index to conditions that are existing in the country. I propose a toast that the ship John Stanton may live as useful a life as the man after whom she is named."

Mr. John Stanton in responding to the toast im-



CAPT. CHARLES L. HUTCHINSON.



JOHN STANTON.

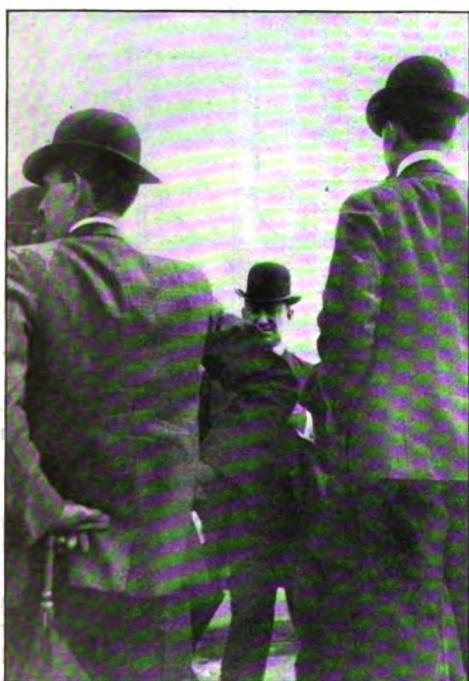
pressed everyone with the genuineness of his remarks. In his preface he asked permission to indulge in a few reflections. These were devoted to the enormous progress made in the art of ship-building and the concurrent arts of mechanical science during the past fifty years.

"Few of you can look back as far as that," he said, "but I went into the Lake Superior country in 1852 to inquire into its mineral deposits with especial reference to silver and copper. After I got to the Sault I had to hire an Indian and a squaw to take me from the Sault to the copper country. These were the days of small things. Peter

White had just shipped six barrels of iron ore from that country when I arrived. The steamers were very small, the houses were very small and the privations were many. I was in New York when the Great Western, the first steamer to reach that city from England, ar-



MR. J. R. ANDREWS AND MR. HARVEY D. GOULDER.



JAMES P. WALSH LOOKING FORWARD; BACK VIEW OF HENRY STEINBRENNER.

rived. The Sirius had arrived at Boston a day or two before. Those steamers were very small in comparison with the steamers of today. The growth of this country since and its prosperity has very largely depended upon three products, iron ore, coal and copper. In 1845 we produced 100 tons of copper. In 1905 we produced 362,000 tons of copper and the balance of the world 271,000 tons. Of our products 93,000 tons valued at \$29,-

000,000 came out of the Lake Superior country. The 362,000 tons had a value of \$105,000,000 which is largely in excess of the value of the coal and silver mined in this country last year. In 1852 England produced 13,000 tons of copper. Last year the company of which I am president produced more copper than the whole of England, and the companies in which I am director, twice as much copper as England has ever produced. I desire to propose a toast 'God bless the ship, God bless the captain and crew and may she be successful in never causing the loss of a human life."

Mr. Goulder then introduced Mr. Martin Mullen who desired to say that Mr. Stanton had made no statistical preparation for his talk but that he was regarded as the copper statistician of the nation. He said that he had known Mr. Stanton for a great many years, had known him when the shares of the Wolverine Mining Co. were selling at \$2 a share and had taken his advice to buy several hundred shares at that figure and at \$3 a share. The stock is now selling at \$125 a share. He spoke intimately of Mr. Stanton's mines, relating how by utilizing the power of a brook stream leading into Lake Superior he had been enabled to work profitably the extremely lean ore of the Atlantic mine yielding only 13 lbs. to a ton of rock at a profit. He proposed a toast to Mr. Stanton as a man who would leave a famous record behind him.

The banquet was brought to a close by Mrs. James C. Wallace proposing a toast to the success of the ship. Those present were: Mr. and Mrs. J. C. Wallace, Mr. and Mrs. William Sauters, Mr. Henry Steinbrenner, Mr. Robert Logan, Mr. John S. Manuel, Mr. Charles D. Jury, Mr. E. T. Bierce, Mr. F. Herman Saal, Mr. W. C. Scott, Mr. and Mrs. M. Andrews and Miss Marcella Andrews, Mr. and Mrs. C. L. Hutchinson, Mr. Harvey D. Goulder, Mr. Martin Mullen, Mr. and Mrs. Chas. E. Myers, Mr. and Mrs. W. H. Becker, Mrs. John A. Donaldson, Mr. and Mrs. W. H. McGean, Miss Drysdale, Mrs. Calvert Hill, Mr. Charles L. LaMarche, Mr. N. S. Keller, Mr. William Smith, Mrs. Jean Smith, Mrs. J. T. Hutchinson, Mr. I. S. Fenn, Mr. William Sutton, Mr. and Mrs. Thomas Dumper and Miss Mary E. Parsons, all of Cleveland; Mr. William Smith of Chicago; Mr. and Mrs. E. J. Fleming of Chicago; Mr. John Stanton of New York; Mr. James P. Walsh of Pittsburgh; and Mr. J. R. Andrews, Bath, Me.

The steamer John Stanton is building for the Pioneer Steamship Co., of Cleveland, and will be managed in the office of C. L. Hutchinson & Co. This steamer was the first ordered for 1906 delivery, but the American Ship Building Co. has exhibited the utmost expedition in her construction and she will probably be able to make two or three trips during the present season. The Stanton is 524 ft. over all, 504 ft. keel, 54 ft. beam, and 30 ft. deep. She has thirty hatches spaced 12-ft. centers. She is of arch construction and the sides of her cargo hopper are straight. Her engines are 23½, 38 and 63 in. cylinder diameters by 42 in. stroke, supplied with steam from two Scotch boilers, 14 ft. 6 in. diameter by 11 ft. 6 in. long, equipped with Ellis & Eaves draft and allowed a pressure of 180 lbs. She is designed to carry 9,000 gross tons of ore but under favorable conditions will probably carry 9,500 tons.

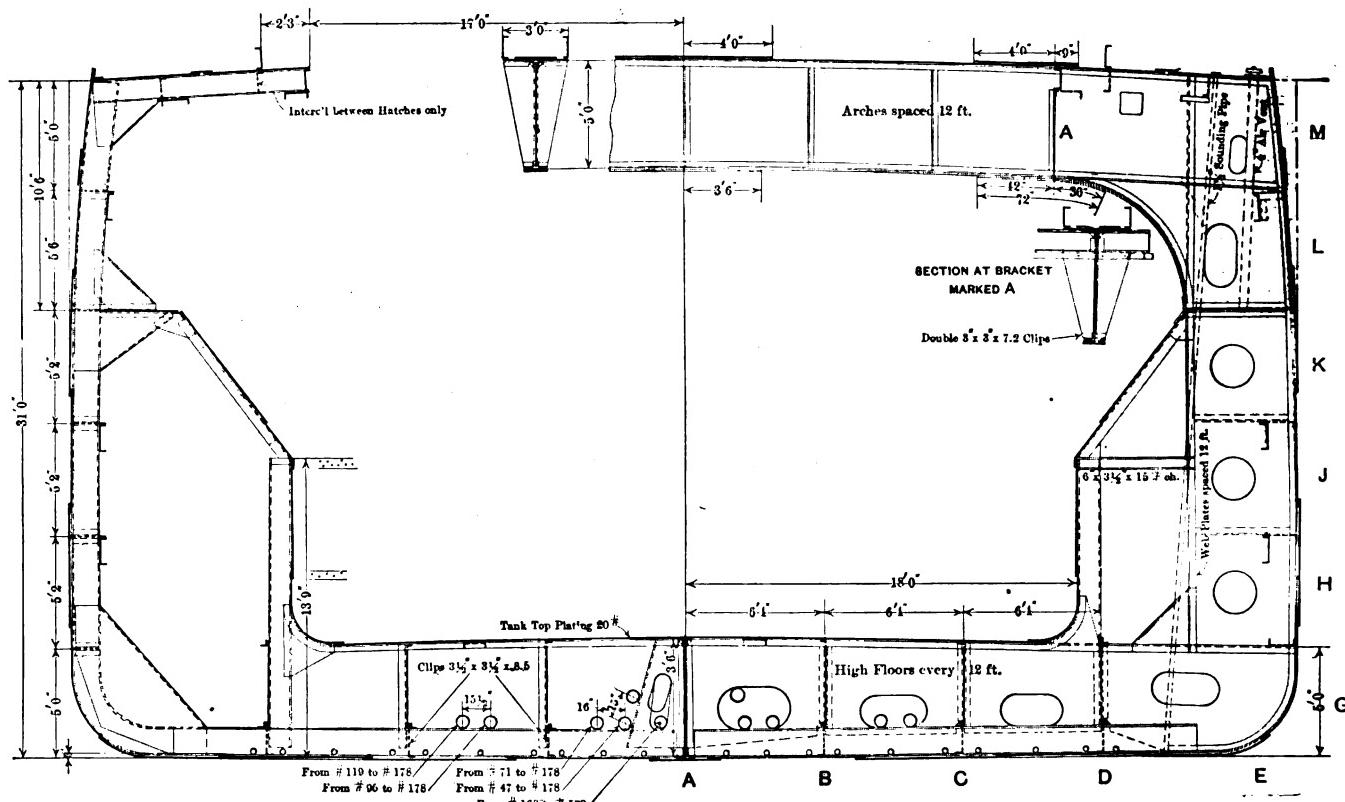
The state of New Jersey will give a silver service to cost \$10,000 to the battleship New Jersey now being completed at the Fore River Ship Yard, Quincy, Mass.

The thirteenth general meeting of the Society of Naval Architects and Marine Engineers will be held at No. 12 West 31st St., New York, Nov. 16 and 17.

THE 600-FOOT LAKE STEAMER HAS COME

Mr. Harry Coulby, president and general manager of the Pittsburg Steamship Co., has placed orders with the American Ship Building Co. for two freight steamers, greater than any now afloat on the lakes, for 1906 delivery. While it is not definitely determined upon, it would not be surprising if orders for two additional steamers were placed by him. The new steamers are to be 600 ft. over all, 580 ft. keel, 58 ft. beam and 32 ft. deep. These steamers will therefore be 31 ft. longer, 2 ft. wider and 1 ft. deeper than the steamers E. H. Gary, Wm. E. Corey, George W. Perkins and Henry C. Frick which have been delivered during the present year to the Pittsburg Steamship Co. These new vessels now hold the cargo records for the great lakes, the Gary having carried 11,043 tons from Ashland to South Chicago. As the new steamers will have a carrying capacity of about 1,300 tons more than the Gary and her sisters, they can safely be regarded as 12,000-ton ships. These two new ships, with the four now in commission, will be able to move in a single

makes it a stouter and stancher ship altogether. Following the design of the Gary the sides of the hopper will be straight up to a distance of 9 ft. above the tank top, when it will be joined to the skin of the ship by an incline construction, as is very well illustrated in the photograph. The system of arch girder construction will be followed, leaving the hold absolutely unobstructed for the operation of the unloading machines. The cargo hold will, however, be divided by one or two screen bulkheads for the purpose of carrying, when necessary, two or three kinds of ore. As water ballast will be carried not only in the water bottom but in the 11-ft. space formed by the hopper and the sides of the ship, the water ballast capacity of the new steamers will be enormous, nearly 9,000 tons, and will make the vessels navigable in any sea. A new pumping system will be installed in the steamers to care for the water ballast, but the details of this system have not yet been worked out. While the new steamers have a beam of 58 ft., the actual reach over which the unloading machines will have to extend is only 47 ft., making the



THE MIDSHIP SECTION OF THE COREY AS ILLUSTRATED HEREWITH CLEARLY INDICATES ALSO THE NEW STEAMERS. AS IN THE
COREY THE BASE OF THE CARGO HOPPER IS 36 FT., THE ADDITIONAL 2 FT. BEAM BEING TAKEN
UP IN THE WATER BALLAST SPACE ON EITHER SIDE OF THE HOPPER.

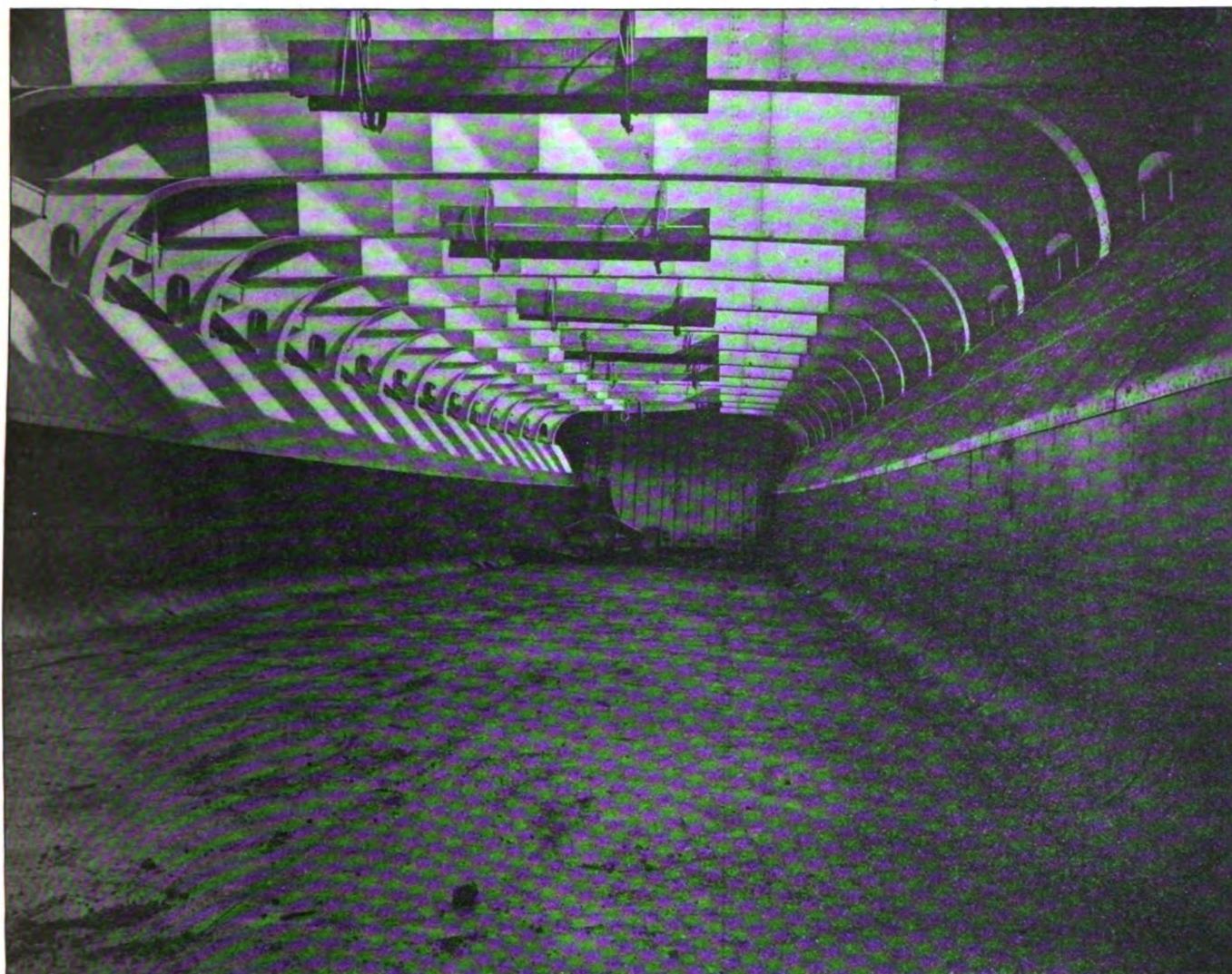
season 1,600,000 tons of ore, which is more ore than was brought down the lakes in any one year up to 1880. The two steamers will be built at the South Chicago yard of the American Ship Building Co. and work on them will be started as soon as the yard can be put into shape. The steel will be furnished by the Illinois Steel Co. and about 4,200 tons will be worked into the construction of each ship.

In general design the new steamers will not differ from the Gary and sisters. Accompanying this article is a mid-ship section of the Gary, illustrated both by line drawing and photograph. While the new steamers will have two feet more beam than the Gary, the cargo hold at its base will be the same width as the Gary, that is, 36 ft. The space from the sides of the hopper to the skin of the ship will be 11 ft, as against 10 ft. in the Gary. This system, while it does not increase the cubical capacity of the cargo hold except as it is increased by more length, nevertheless gives added buoyancy to the ship and in Mr. Coulby's judgment

distance to be traversed by the arm of the machine even less than it is in some of the older types of boats of smaller maximum beam.

Like the Gary and her sisters, these new vessels will have exactly the same engine power as the Manola, built fifteen years ago by Pickands, Mather & Co. The engines will be 24, 39 and 65 in. cylinder diameters by 42 in. stroke, supplied with steam from two Scotch boilers, 15 ft. 4½ in. diameters by 11 ft. 6 in. long, equipped with Ellis & Eaves draft, and allowed a pressure of 170 lbs. In equipping these giant steamers with this moderate power Mr. Coulby emphasizes the economy and real value of low power in a great steamer.

"During the recent storm on Lake Superior," said he, "we gave the Corey about as severe a test as it was possible to give a steamer. The wind was blowing sixty miles an hour and yet the Corey came through it with the Bryn Mawr in tow without the slightest injury and without apparent



VIEW OF THE GARY'S CARGO HOLD SHOWING THE REACH OF THE HULETT CLAM SHELL MACHINES.

strain to herself and her consort. We have some other ships of higher power in our fleet that were pretty badly used up as far as their upper works are concerned. The punishment that they received was probably due to the fact that they were sent through it flying without check. Whenever a steamer has high power there is always present the temptation to use it. You rarely hear of a steamer of low power suffering severe punishment in storm."

This makes the forty-fifth order that great lakes ship builders have received for vessels for the ore trade since the first of the present year. There are now twenty-four ships under order for next year, of which the American Ship Building Co. will build nineteen, the Great Lakes Engineering Works four and the Craig Ship Building Co. one.

AROUND THE GREAT LAKES

The steamer William G. Mather, the widest ore carrier on the great lakes, will be launched at the Ecorse yard of the Great Lakes Engineering Works on Saturday next. The steamer will be christened by Miss Katherine Mather.

The steamer George T. Hope of 1,558 tons, is for sale. Bids will be received for the purchase of this vessel by George L. McCurdy, 169 Jackson boulevard, Chicago, and will be open Sept. 28. This steamer can be seen at Cleveland.

On one of the bodies that washed ashore from the wreck of the Pretoria at Outer island, a ring was found (plain gold band ring) bearing the following inscription upon the inside: "Selma, 2-14-1905." This would indicate that the wearer

was married on Feb. 14, 1905, and that his wife's name was Selma. Nothing more was found upon the body by which it could be identified. The remains were buried at Bayfield.

The barge George W. Roby, which has been aground at the Lime Kiln Crossing since Sunday night last, caught fire on Tuesday and was totally destroyed. The Roby was launched as a steamer at Bay City in 1889, but last winter her engines were taken out of her and put in the new steamer Francis L. Robbins. She grounded on the Lime Kilns while upbound with a cargo of soft coal. The Roby was owned by W. H. Becker, of Cleveland, and was insured for \$40,000.

Bids were opened by Major Charles L. Potter, government engineer, with headquarters at Duluth, on Sept. 18, for improving the harbors of Duluth and Superior. The amount available for this particular part of the work is \$17,000. The bidders and bids were as follows: L. D. Campbell & Co., Duluth, Minn., \$17,648; Duluth Electrical & Construction Co., Duluth, Minn., \$16,379; Bergquist Bros., Duluth, Minn., \$17,865; J. F. Schleunes, Duluth, Minn., \$17,340; Emil M. Johnson, Minneapolis, Minn., \$20,600; J. A. Robert, Duluth, Minn., \$16,700; Theoph. Naufts, Duluth, Minn., \$18,200; John Grandy, Duluth, Minn., \$19,197; J. R. Quigley, Duluth, Minn., \$17,950; Hanson Bros., Chicago, Ill., \$20,864; Geo. H. Lounsberry, Duluth, Minn., \$17,350; John Donlin, Superior, Wis., \$17,900; W. J. Turnes Co., Chicago, Ill., \$19,934; Clark Construction Co., Chicago, Ill., \$21,382; B. M. Zadeck Co., Chicago, Ill., \$24,000; Congress Construction Co., Chicago, Ill., \$20,900; A. Motschman, Chicago, Ill., \$17,990.

NEW GASOLINE VESSELS

Within the last year, a number of large gasoline vessels have been built and fitted out in San Francisco, Cal. Several of the largest are intended for the Alaska trade. The degree of success that will attend these vessels will be watched with great interest by ship owners generally, as they are considering the project of building and fitting out a number of lumber vessels with gasoline power. The largest gasoline vessels in the world are equipped with Union engines manufactured by the Union Gas Engine Co., of San Francisco, Cal.

The new three-masted schooner Sotoymo, owned by the Albion Lumber Co., of San Francisco, which made a very successful trip a few weeks ago, is equipped with Union three-cylinder twin screw engines of 300 H. P. fitted to run on crude oil. She is to ply between San Francisco and Albion as a lumber carrier. The Sotoymo is fitted out with electric lights generated by a dynamo driven by an auxiliary Union engine. This will enable the crew to load or unload cargo night and day, which will be a great saving of time. She is 170 ft. long, 40 ft. beam, and 9½ ft. hold; tonnage 503. This vessel was built at the Oakland ship yards.

The new passenger boat Anvil, belonging to the John J. Sesnon Co., San Francisco, left there very recently for Alaska. She is fitted with twin screw Union three-cylinder marine engines of 300 H. P., and 8

H. P. Union electric engine and 8 H. P. hoist and windlass. Her length is 127 ft., beam 25 ft., hold 8 ft. 9 in., tonnage 370. The Anvil is the largest gasoline passenger boat afloat. She was built at the Fulton Iron Works of San Francisco.

The four-masted schooner Argus, which made her maiden

voyage a few weeks ago, is owned by the Pacific Shipment Co. of San Francisco. She is fitted with twin-screw three-cylinder Union marine engines of 300 H. P., running on crude oil, and a 5 H. P. electric light engine. Her length is 162 ft. 4 in., beam 40 ft., depth 13 ft. 4 in., tonnage 556.61. She is the largest gasoline vessel afloat. She was built at the

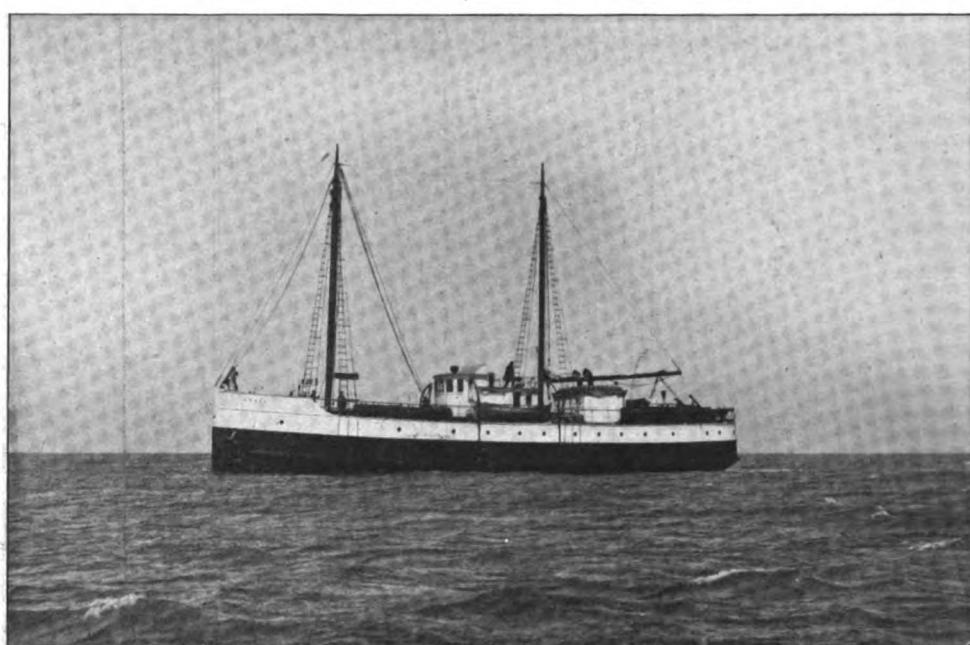
Wm. Boole & Sons shipyard. This vessel will ply in the Alaska trade.

The schooner Oakland, property of Hunt, Hatch & Co. of San Francisco, made a successful trial trip last week. She

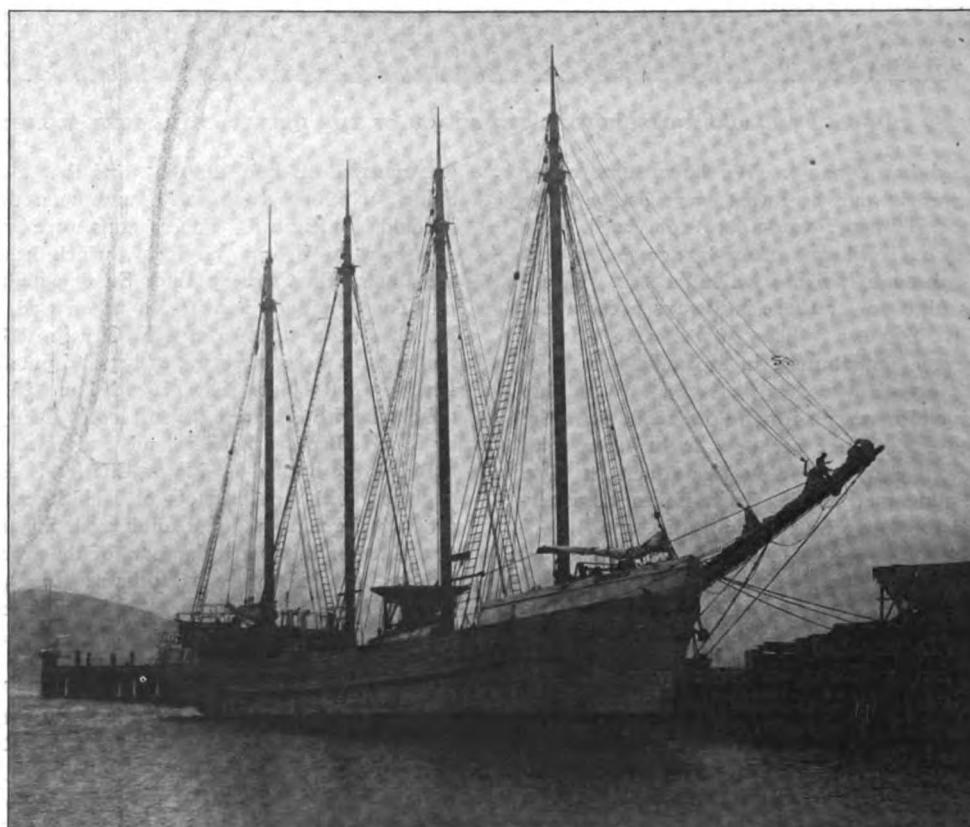
is equipped with a 100-H. P. Union three-cylinder engine running on distillate. Her length is 106 ft., beam 24 ft. 6 in., depth of hold 9 ft. 2 in., tonnage 143.

The Union Gas Engine Co. will also install in oil barge No. 4, owned by the Pacific Coast Oil Co., San Francisco, twin screw Union three-cylinder engines of 300 H. P., running on crude oil, and a 25-H. P. electric light engine.

Mr. C. A. Griscom, formerly president of the International Mercantile Marine Co., has just returned to the country from a visit to Japan.



GASOLINE SCHOONER ANVIL, LARGEST PASSENGER GASOLINE VESSEL AFLOAT.



SCHOONER ARGUS, LARGEST GASOLINE VESSEL IN THE WORLD.

THE STEAM TURBINE

The progress made in the turbine system of steam propulsion of vessels and its growing use in other directions renders some particular reference to that system timely. In a paper prepared recently by Mr. W. Owen Wilkins, M.I.E.S., some interesting particulars as to the economy of turbine engines as compared with reciprocating engines, having regard especially to the marine steam turbine engine. Referring to what he terms "the absolute efficiency of the turbine system for ship propulsion," the author declares its demonstrated success to have been only possible through the zealous labors and scientific study of the problem made by its inventor, Hon. Chas. A. Parsons, F.R.S., whose experiments have effected in ten years what is almost a revolution in the form of machinery for propelling fast vessels. Appropriately enough, the writer devotes his first page to describing the mechanical principle of the turbine, thus:

The Parsons turbine consists of a cylindrical case with numerous rings of inwardly-projecting blades. Within this cylinder, which is of variable internal diameter, is a shaft or spindle, and on this spindle are mounted blades, by means of which the shaft is rotated. The former are called fixed or guide blades, and the latter revolving or moving blades. The diameter of the spindle is less than the internal diameter of the cylinder, and thus an annular space is left between the two. This space is occupied by the blades, and it is through these the steam flows. The steam enters the cylinder by means of an annular port at the forward end; it meets a ring of fixed guide blades, which deflects it so that it strikes the adjoining ring of moving blades at such an angle that it exerts on them a rotary impulse. When the steam leaves these blades it has naturally been deflected. The second ring of fixed blades is, therefore, interposed, and these direct the steam onto the second ring of rotating blades. The same thing occurs with succeeding rings of guide and moving blades until the steam escapes at the exhaust passage.

The first vessel fitted with a steam turbine engine, the Turbinia, 100 ft. long and 9 ft. beam, was built at Wallsend-on-Tyne in 1894, with a single engine, and her earliest trial was on Nov. 14, that year. First one shaft was tried, which carried in succession, in different trials, one turbine, then two, and so on. Next two shafts were tried, and finally three, with one or more propellers on each. Finally the best results seem to have been reached by using three shafts, dividing the turbine so that one-third of the total power of the engine is applied to each of the shafts at once—the high pressure cylinder driving one, and the low pressure cylinders one each. The Turbinia attained a speed of 34 knots, or more than 39 miles per hour, and this speed was maintained for a series of hours. No such speed had ever before been attained on water. The naval authorities of the country, attracted by these performances, ordered in 1896 two torpedo boat destroyers of 340 tons each, to be built and fitted with turbine engines. These, the Viper and Cobra, attained a speed of 42 and 41 statute miles per hour respectively. Unfortunately both swift vessels came to grief at no great age; the first being sunk by striking a rock off the Channel Islands, the other being lost in the North Sea. They carried three and even four screw shafts with two or more propellers on each, and had two distinct sets of engines on either side the vessel.

But the passenger steamer people had not been idle spectators of such speed on the water, and soon showed their practical interest by still more practical orders for the new engine. Next to the destroyers in point of time came the steamers King Edward and Queen Alexandra, which appeared in 1902 to take part in the Clyde passenger trade. These are 250 and 270 feet long, and their mean trial speed was 23 miles an hour. Since then, some twenty steam passenger boats, steam yachts and government steamers have been fitted with turbine engines, among the latest being the Canadian

lake steamer Turbinia, the Victorian and Virginian, of the Allan line of ocean steamers, 11,400 tons each, and the Cunard line steamship Carmania, of 21,000 tons. And now the turbine engine is being fitted for other purposes than marine propulsion, for its economy is being found out. And they are made in various places in England besides the Parsons' works, notably in the British Westinghouse works in Manchester.

Mr. James Denny, the well known Clyde shipbuilder, has made known some valuable comparisons between the speed, carrying power, and coal consumption of turbine vessels and those with reciprocating engines. Compared with a Clyde paddle steamer with engines of the old type, the King Edward saved 20 percent in coal; and compared with triple reciprocating engines of same boiler capacity she made a mile an hour better time, and had much less displacement, owing to the lesser space in the hold occupied by turbine engines.

SIDE LIGHT ON SEVONA WRECK

The wreck of the Sevona off Sand Island, Lake Superior, may result in a number of changes, and improvement in the government service among the islands. It has developed the fact that had the lighthouse keeper at Sand Island been supplied with the proper appliances or even with a fairly serviceable boat, he might have saved the lives of Capt. McDonald and his six men. Mr. Lewich, the keeper of Sand Island light, saw the Sevona go on the reef, heard the whistles of distress, and says that with one good man and a good boat, he could have put out to the wreck and taken off the seven men. Mr. Lewich says that the men were not drowned on the Sevona, but that Capt. McDonald and his unfortunate crew had built a raft, that they nearly reached Sand Island, but were wrecked and drowned in the breakers. He claims to have seen them on the life raft, after they left the Sevona. It is suggested that if the lighthouse had been connected with the mainland by telephone, a tug could have been dispatched from Bayfield, and the lives saved. Sand Island is only about two miles from the mainland.

Vessel masters are unanimous in urging that gas buoys be put in on Sand Island shoal, York Island shoal, and Bear Island shoal. The lowest depth of water on Sand Island shoal, is 16 ft., at York Island shoal, 18 ft., and at Bear Island shoal, 6 ft. In calm weather, or in thick weather, light vessels might pass directly over them, without knowing that the rocks were beneath. At present these shoals are unmarked.

MERELY ADDS EMPHASIS

Editor Marine Review: Referring to the statement which appears on envelopes of the *Marine Review* in regard to absence of American shipping in foreign ports during 1903, I would call your attention to the following interesting exception which occurred in that year. On Dec. 11, 1903, the steamer Mississippi, Atlantic Transport line, American built and under the American flag, arrived at Bremen Haven with a cargo of cotton from New Orleans. After discharging same, she sailed Dec. 23.

This is said to be the second time that an American merchant ship has entered the port of Bremen; the first time having been in 1876.

Yours truly,

ROBT. S. HAIGHT.

The four-masted schooner Theoline built by George A. Gilchrist, Belfast, Me., for the McQuestion Bros., Boston, was launched last week. Mrs. H. E. Eaton, wife of the principal of the Belfast high school, acted as sponsor for the vessel. The schooner is 186 feet long.

FREIGHT SITUATION

In handling the ore trade of the great lakes during the present year, conditions have been somewhat reversed. Whenever congestion has occurred in the past it has been at Lake Erie terminals, caused either by the inadequacy of the unloading equipment to care for the vessels as they arrived, or the inability of the railways to furnish cars. It has been the usual thing to say that the capacity to handle the ore trade is limited by the efficiency of the receiving docks. During this year, however, the heaviest of all years, vessels have been cared for at Lake Erie docks as they came and it has been a common thing to unload the largest steamers in a single day. Of course, records such as were

able to care for the ore movement. It is likely that the wild rate will close as it opened, at 75 cents. Over 21,000,000 tons of ore had been brought down by Sept. 1 and over 25,000,000 will have been brought down by Oct. 1. This will leave between six and seven millions for the two months and few days in December remaining, and there is no doubt whatever as to the ability of the fleet to handle it. Dispatch of Lake Erie docks from now on, however, is not likely to equal the record of the preceding months. The car supply is falling short owing to the general increase in trade and the diversion of the cars by the railways to other business.

There is a noticeable let-up in the coal movement. The coal movement throughout the year has been fairly steady



THIS PHOTOGRAPH OF THE STEAMER WILLIAM E. COREY, TAKEN IN ST. MARY'S RIVER, ILLUSTRATES EXCEEDINGLY WELL BY COMPARISON THE GREAT LENGTH OF THE STEAMER. THE REVENUE CUTTER MORRELL IS LYING ALONGSIDE OF THE COREY.

made by the Wolvin last year and by the Perkins this year, are unusual and do not prove much in a commercial way beyond the fact that such dispatch is possible. Such rapid dispatch, however, is not practical because a great deal of time is really taken up in preliminary arrangement. But it is practical to unload a great steamer in a day's labor, and it has been done times without number this season. There have been no delays at all up to the present time at Lake Erie docks. The delays, such as they are, have been at upper lake ports. The excessive rains in the Lake Superior country have repeatedly flooded some of the more important mines and have prevented shipment to docks. For that reason vessels have really had more trouble in loading cargoes than in unloading them. They have had to do a lot of shifting to get a full cargo. Nevertheless, notwithstanding this handicap, the upper lake docks have done magnificent work, sending forward 5,000,000 tons per month. The management of the shipping docks requires great skill, since in proportion to their monthly output they have extremely limited storage capacity. Trains run upon them at half hourly intervals and it requires much coolness, courage and expedition to handle one train and get it out of the way before the other arrives.

Wild chartering has been light, contract vessels being well

and reports from upper lake docks indicate a good supply on hand.

Fog has prevailed on Lake Huron during the past few days and a number of strandings occurred. In fact some vessels got surprisingly out of the beaten track.

Fire broke out in the pattern loft of the Featherstone Foundry & Machine Co., 348 North Halstead street, Chicago, on Thursday, Sept. 14, and destroyed the upper portion of that building and its contents. The fire was hardly over before arrangements were made to repair the damage to the building and contractors guaranteed to have a new roof on before Sept. 20. A heat was taken off in the foundry the afternoon of the day the fire occurred and the blacksmith shop and a portion of the machine shop were started the following morning. A large force of patternmakers were put at work replacing the patterns that were destroyed, and the company anticipates no delay on its contracts. The company is prepared to execute all orders for dipper dredges, ice making and refrigerating machinery, ammonia fittings and gray iron castings. The officers of the Featherstone Foundry & Machine Co. are C. M. Hewitt, president; E. C. Tourtelot, secretary; F. E. Frazier, treasurer, and A. E. Croft, general manager.

MY FIRST VOYAGE

The First Experiences of one of the Oldest of our Lake Pilots.

William Vessey.

I was born in the city of Lincoln, in Lincolnshire, England. My father Charles Vessey was a butcher, and cattle jobber, and was the younger and only brother of Samuel Vessey, Esq., who by virtue of being the oldest son, was the proprietor of the large estate called Hatton Manor, Holtonholgate, near Spilsby, Lincolnshire, England. At the age of ten, I was bound as an apprentice on board of a brig named the Falcon, hailing from Hull. Having atrysail mast close in at aft the mainmast she was called a Snow. She was at that time (sixty years ago,) the largest brig in England, and I should say the oldest, for she had sailed the salt seas over eighty years. Narrow aft, very deep, and sharp under water, she had just returned from Ichaboe, South Africa with a cargo of guano and from the smell of it I and the rest of the crew did some lofty sneezing. Her crew consisted of captain, mate, second mate, and steward, with twelve men, and two apprentices. I was so physically developed that every one placed me at fourteen years of age. The vessel was in ballast, and water and provisions were aboard. In the cabin were the whole crew, and more with them. Capt. Smith was reading the articles which stated the amount of wages to be paid, the amount of provisions, and kinds to be dealt to each man, with four quarts of water per day, as being a full allowance per man. So much of rum, and lime juice. That a man signing these indentures must give the captain possession of his register ticket, must be able to hand, reef and steer, knot, and splice. As each man signed, I closely scanned his countenance, and was well satisfied that my lot was to be cast for this voyage to the Spanish Main, South America, in a respectable company of men. The seamen of that day when well dressed, wore a tarpaulin hat, a blue roundabout jacket trimmed with buttons in numbers, and an outside pocket on each side, with blue cloth, or fine white duck pantaloons, skin tight around the hips and thigh, and very loose at the bottom, and to finish him off he generally wore low shoes, a white duck jumper loose around the neck, with a large collar held in its place by a folded black silk handkerchief knotted four-in-hand around the neck. After all this the captain received each man's register ticket, and gave him a month's advance wages. Now this register ticket was presented to every man who had faithfully served his apprenticeship, and was recommended by his employers as being an able seaman. William Ward, who owned the Falcon and about fifty other vessels of different rigs, made the statement that the master of his every ship had served their apprenticeship in his employ. After leave-taking with our pilot on board we were sailing down the Humber with a northwest wind, and tide being with us were soon past Grimsby, with Spurn Head on our weather quarter, and now the pilot boat takes off our pilot. I heard the old man say that he had served his time here and piloted forty-five years, and that the Falcon was here many years before he was. I must tell you that her sharp bottom, and high transom made her an easy vessel in a sea. For three days I was very sea sick, and was of but little use to the ship, and took but little note of what transpired, but this I know that the carpenter built a chain locker, to hold the first chain cable she ever had. Previous to this, was an eight inch hemp cable laid hawser with three turns around the barrel of the windlass. When heaving up the anchor a selvage strap was attached to the cable abaft the windlass, a long tackle hooked to this and aft to a ring bolt, and the fall taken to the capstan, two men and a boy to hold slack,

were employed in taking in the slack of cable. Whilst with eight feet handspikes, the rest of the crew heave up the anchor. And now with the chain came the patent windlass, and afterwards the double purchase iron capstan. This vessel was held to windward by a standing keel, and drew twenty feet of water when loaded. Below the deck at about ten feet were beams running across the vessel, called hold beams, and between these, and the deck above is called between decks, and the after part of this is called the half deck. In this place lived the second mate, carpenter, and myself. Every man up to the second mate had to furnish his own hammock and bedding, also knives, forks, spoons and dishes. I had hard work to get into my hammock without spilling out on the other side. As we passed the high white cliffs of Dover, we were shut in by a dense fog, but what wind was, was fair. Steam ships were not as plentiful then as now, but sailing vessels were many, and the fog horn was heard in many directions, and were suddenly confronted with an enigma difficult to solve. We were going with yards square and mainsail clewed up, and off before the wind. Whilst a craft of some kind was beating to windward on our port bow, and running across our course, and ahead of us, another was on the other bow doing the same thing, it was an anxious time until we heard the shaking of the gibs on both vessels, by this we knew they were coming in stays, and none too soon for we passed one of the vessels, a full rigged ship within twenty feet. There was a great deal of shouting, rattling of blocks and lines, and shaking of sails, but there was no lack of presence of mind, or good seamanship. Capt. Smith, mate Brown and second mate Jones, were all brought up in Mr. Ward's employ, and the younger the better from ten years up as apprentices. Of her crew of able seamen, six were Hull men (one being a rigger and sailmaker) four were Scotch, one German, and the carpenter a Londoner. The other apprentice a Yorkshire boy, and a nice young fellow he was, for whenever he could get time he would take pains to show me how to make fancy knots, splices and everything pertaining to the working of the vessel. Taking me around, and showing me the running gear to every sail, naming each line, and where each was belayed. If a man aloft of a dark night hauls the deck to let go, or haul taut on any line he names, you must be able in extreme darkness to find that line amongst a lot of others. Perhaps you are suddenly aroused from a deep sleep, in a warm bed, with but few clothes on your back, and up aloft you go on a topsail yard to reef topsails. The vessel rolling and pitching, with fingers numbed with the cold rain. This was our experience after having with top, lower and top gallant studding sails set reached and passed the Scilly Islands, and got fairly out on the broad Atlantic. And now came a furious gale from the south-east, and blew so hard that the vessel was hove to under a close reefed maintopsail, balance maintrysail, and fore topmast staysail. With helm lashed down (for we had no patent steering gear then) and with port tacks aboard this little vessel struggled along in a tremendous sea. In all my previous dreaming of life at sea, it never occurred that such a state of affairs could be. It seemed when she listed forward that the masts must fall over the stern, and when lifting aft that she take her last dive. So good a sea boat was she that no green sea ever washed her decks. The old fashioned and best of all logs (with its triangular log ship reel, and sand glasses) was hove and leeway was computed at six points so that what way we made was in the direction we were bound, namely to Trinidad, in search of guano. We had good faith in our brig for all she was so old, being copper fastened, British oak; live oak tree-

nails, new topsides, and copper sheathed. Every sail was made of linen canvas at that time and was stiff and hard to handle in wet cold weather. This gale lasted two days, and it pleased me and the rest to see her forging along at a good rate with a good breeze on our starboard quarter, with top and top gallant studding sails set on weather side. For one whole night, a large body of porpoises were running with, and all around the vessel. The whole vicinity of water shining with a phosphorescent light caused by the big fish (like a flock of black sheep jumping a fence), jumping nearly their length out of the water, and with great regularity. Every thing seemed smooth and well with the crew, but every thing was not as it seemed, for after a few days two of the men came aft with a big chunk of beef and hard bread; the mate was on the quarterdeck and asked what they wanted. The man with the beef answered.

"We don't want no row, but we do want som'at we can eat, please sir, will you chew this 'ere piece of mahogany. We made some tobacco boxes out'n it; and this 'ere 'ard tack is chock full of weevils, so take it all round we are hungry as dogs!"

Hearing the last sentence, the captain came on deck.

"Well, men, what's this about?" Well, sir, we're willin' to do our duty on this 'ere brig, but we wants som'at to eat as we can eat, but this ere stuff is too 'ard for our grinders, and as British seamen on a British vessel, we ax you to pass your judgment on the same."

"Well" speaking to the mate "did you examine their cause of grievance Mr. Brown?"

"I did si:, and will say: it may be nutritious but not palatable, and I do not believe Mr. Ward ever knowingly had it put aboard."

"Well men," says the captain, "this is a bad place to find this all out. Open another barrel of beef, and bread. Likewise give the men soup and pork, and an ext:a duff and molasses."

"Thank you, sir, that's the best I ever see'd on any vessel."

I never heard of any more difficulty. We were now in the latitude of flying fish, dolphin, boneta, and albercore. A stout made line, with large hook and baited with red and white cloth or bunting, was fastened to the outer end of the jibboom, so the hook would dip in the water when the vessel would rise and fall with the roll of the sea. Wind or no wind the roll is always there. They had set the line when I was asleep below, and as I came on deck at eight bells I looked forward and saw a man coming in along the bowsprit with his arm around a large fish, and with its tail in between his teeth, whilst another man had it by the gills and head. It was a sight to behold, this great fish with its exquisite coloring of gilded green, red, and purple, with large round spots throughout. It seems that the dolphin swallow the flying fish whole, for when we dressed our fish we found four just as they were caught. I noticed they were as large as a full sized herring, with wings of long slender white bones and when expanded looked as though between the bones was isinglass. Although the dolphin is not a dry sweet fish it is a great change for the better over salt horse. And from this on we had several feasts. Under the outer end of the bowsprit is a short spar called the dolphin striker, this is hooked or shackled under the cap and hanging down about eight feet and at lower end are guys, and back ropes. A man with a spear called grains with a strong line attached to it would (supported by back ropes), spear large fish. One of the men seeing some fish running with the vessel, seized the grains and swung out to spear one, lost his hold and fell overboard, losing his grip on the spear, passed under the vessel, and

rose at the stern. His shouts attracted the attention of the man at the wheel, he throwing two life buoys over after attracting the man's notice. The helm is put down, the yards braced round and main topsail laid aback, and she is now hove too. A quarter boat lowered, with three men, two to row, and one to steer, and locate the man, which was soon done. We were soon back on our course again. The weather now was intensely hot and winds light, and shifting; this is what tries the sailor's temper. The watch on deck are oftentimes a busy crowd. Squaring the yards for a fair wind, setting studdingsails, and now she is reaping the benefit of a fair wind, but without any warning the sails are aback, and down come the studding sails, the yards braced up sharp and she is beating against a head wind, and for three long weeks we were tortured by such weather.

Any man under such circumstances would learn to swear. We had now been under way six weeks, and sighted no land yet, but the sea was of a lighter color, and there was a good deal of debris floating around. One bright moonlight night a school of flying fish landed eight of their number in the belly of our fore spencer, and dropped on deck; these all went into the cabin. Now you must not think because I have not mentioned it, that we had no good times, for we had some good vocalists, also the German had a fine accordion, and was a talented performer on the same. As for yarns under the lee of the long boat, "well I should say." Time wore along and one morning orders were given to look out for the land, at the same minute, the other apprentice up on the fore royal yard, hailed the deck, stating that he saw something like land, and nearly ahead, and so it proved for in two or three hours there was plainly to be seen a conical hill, and some smoke further to the northward. This turned out to be the Island of Tobago. The next day we were anchored under the west side of Trinidad, then only inhabited by a few Portuguese, and Indians. After thorough searching and enquiries, we found out there was no guana on the island. Got under way and were soon speeding along, and bound for Rio de la Hacta to receive orders, but as we were beating in to that port, we met the barque Hope, one of our owner's vessel. She had orders for us to go to Santa Marta, as Mr. Ward had an agent there. Around us were a lot of fishing boats, and scores of pelicans trained to catch fish, and fill their large gullet, and then return to their boat and made to disgorge the fish, and then go and fill up again. A boat came alongside whilst we were hove too and getting our orders. Our second mate was a perfect master of the Spanish language, and through him some bartering was done in fruit and tobacco, though they had no large stock of either. They had a parrot, which one of our men bought for a sheath knife. It could speak many Spanish words, and short sentences, like mariners, who catch many foreign words without knowing their definition. It caused quite an excitement, great pleasure to meet with your own countrymen, and ships in a faraway foreign land. For at that time of sailing vessels the Caribbean sea was a long way from home, and the Caribs were pronounced cannibals. After four hours of a good time, we parted, each went his way. After over a week, we were becalmed off Santa Marta, so the boats were lowered, and with oars towed the Falcon into this snug, but very small harbor. Entering we douced our ensign as a matter of courtesy. I will briefly describe this very small, round harbor. Five acres will nearly cover its waters. At that time a small battery of small old time guns faced you as you entered, and on low ground near the water. On your port hand is an island, containing not more than one and one half acres, and about sixty

feet high. On its summit was a small Spanish fort. Our anchors held her ahead, but we had to make her fast with hawsers to the big trees astern. This little place was enclosed by forest clad hills, and during our four days' stay here we never saw any but Spanish soldiers. And only just in the vicinity of this little hamlet did we see any land cleared for cultivation. The forest was full of odd sounds of apes, marmozettes, parrots, and many other creatures. Our agent was at Savanilla procuring for us a load of fustic and logwood. Beautiful as this bowl is I would not live there a year for any sum of money. Why it was so hot the pitch would ooze out of our decks, a bare foot placed there would be blistered quickly. The guns of the soldiers were all flint locked muskets carrying ounce balls. These fellows did not seem to have energy enough to kill the vermin which they carried around with them. At night it was cool, and with good lines and hooks, which were baited with pork we got several large catfish which were relished much. With a large iron barrel hoop covered with a rope yarn net, in this net some bones tied to the middle of the net and like scales, was held by three ropes coming into one, and lowered to the bottom. This was hauled up three or four times a day, and almost every haul we got one or more lobsters or crayfish. We had plenty of fruit, and of many kinds. Music was to be heard at all times; the Spaniards are able to render fine music with a guitar. Besides the soldiers had a military band, and this along with our own was hard to beat. We were not allowed to go ashore, for British sailors never loved a Spaniard, and should they procure a little rum, something would happen not desirable. A bomboat came alongside. She had oranges, lemons, limes, yuccas, yams, bananas and pomegranates. You cannot imagine the difference in the taste of these fruits newly taken from the vines and trees, and those bought on the northern markets. Lying in the calm water, we often saw sharks nearly motionless with part of their back fin out of the water. A small schooner came in and on it was our agent. And now for the first time since the vessel was built, and the first time most of our crew, hove up with a brake windlass a chain cable. Even the captain and second mate had never been shipmates with one. We had to wait until evening for the off land breeze to get under way. It was dark ere the wind came; and through some mishap we got on the rocks. We had two six pound quarter deck guns, one was loaded and fired, causing a great commotion in the two fortresses. After beating to arms they learned the ins and outs of it, and we soon had a large boat to carry off an anchor, and a crowd of men to heave her off, but we had to shift some of our ballast aft. The trouble was the tide lowered the water before we could get our anchor out. It was nearly morning ere we were afloat, and the wind was dying away to give the regular daily sea breeze to come in. But with what wind we had, and the Spaniards' oars, we got quite an offing, and when the wind shifted we were ready for it. As it is but a short run, it did not take us long to run it, and we found ourselves entering a river, several miles wide when inside, but with a dry sandbar stretching nearly across its mouth, leaving a deep channel about half a mile wide. Up this river we sailed for about eight miles and let go both anchors. And now came a busy time. The vessel was very sharp and required a great deal of ballast; and as we take the ballast out, we must put the logwood in. And now was my chance to learn; for we had to send down our royal, and top gallant yards, and masts, to get the long boat, and jolly boats afloat. All our ballast had to be carried near the shore in these boats and two bungies. A bungy is two immense canoes

with a deck across the two and connecting them firmly together, but leaving a space of about seven feet between the canoes under the deck. They have a square sail and come down the river with the off-land breeze at night. The fustic was cut in 4-ft. lengths and was sold by the cord, European measure. A large water-tight box was filled with the wood, then a lid put on and fastened down and then filled with water. Then the wood was taken out and the space of the water measured, and deducted from the measure of the wood, thus giving exact measure. Our agent had been up the river and a large quantity had been measured and loaded on bungies, so that two days after we got there we had several of them hanging to our stern loaded. I forgot to mention a circumstance which happened on our last run. We took on board at Santa Marta three West India negroes as laborers to assist in loading. It fell calm and at a distance of over 50 rods from us was a turtle asleep on the water. One of these men, with a large sheath knife in his belt, and a piece of spun yarn in his mouth, slid down the bobstays into the water and swam for the turtle, keeping a sharp lookout for the back fin of any shark in his vicinity. To settle with which the big knife was carried along. Swimming carefully up to the turtle he slipped a running noose over one of his flippers (which always hang down when lying asleep), and threw the rope across his back, then swimming around to the other side and pulling gently to get in the slack, now throwing his breast on the turtle and pulling at the same moment, turned it on its back. And now the gig was launched and the turtle hoisted aboard, although not considered large, it must have weighed not less than 200 lbs. It was a feast. These fellows with a knife will go into the water and kill a shark; that is, if the fish has the courage to attack him. When anchored, Capt. Smith, with one of the negroes, and the other apprentice and I, boarded our gig for a long row up to Savanilla, but a small sail, and the never failing daily sea breeze eased our pain, and we had a good chance to see our surroundings. From the mouth of the river up to what was called Savanilla, on our starboard hand was a dense tropical forest, filled with all kinds of animal life excepting man. On the port hand and far away were palm trees and cane-brakes with a few isolated hills. The water in the river was very brack, as the tide rose and fell. Many times we saw the back of a shark above water. At about the noon hour, and where the river was not more than a mile wide, we landed. Two large hounds opposed us, and so fierce were they that it was hard to call them off. The place of residence was neither large nor pretty, excepting that the grounds and gardens were just covered with beautiful flowers, and every tropical fruit was in profusion there. A log house was there for the accommodation of the slaves, of whom four of them were sitting on the hard clay floor (it being Sunday), and were playing cards, laughing and seemingly enjoying their life. At the house were our agent, two Spaniards and two skinny yellow-skinned women, with two young negresses. In many cages built of bamboo cane were many parrots, paraquites, and marmozettes. We had an all-sufficient quantity of fruit, nuts and some wine. Of all the people we saw that day, our agent was the only one who could speak English, and he was the interpreter. The people eat but little animal food. Corn cakes, rice and yuccas, yams and fruit are eaten. The heat in the day was oppressive to us, and at night was cool and pleasant, requiring covering. I being young was at all times fearful of scorpions, centipedes, coyotes and serpents. This part of the world at that time was sparsely settled, and was nearly as nature formed it. There must have been settlements further up the river, for on each bungie were three or four

men; and perhaps not far above the place we were then in. On one of the bungies was a negro who had lived many years on one of the British islands in the West Indies and could talk with us. I traded a sennet hat with him for a great crimson-headed macaw. One wing was cut nearly off so it could not fly, but he could, and did climb to the main top gallant mast head by the back stays. He lost his hold and went sailing till he landed on a bungie and broke his neck. I grieved a good deal, but the north of Ireland man gave me a lovely paroquette, which I liked better. When we first landed with a boat load of ballast, I strolled a short distance on the white gravel beach and sat down on a large boulder. All at once I heard a hissing sound, and looking round saw a large, brilliantly colored snake. I did not stay to take in its dimensions, but it was a vast deal larger than any I had ever seen. I suppose when I ran one way he ran the other, for we went back to find it, but it was gone. The little apes, parrots and many other kinds of such animated nature were thick in the forest alongside of us and their different cries were incessant. I asked Job, the negro who spoke English, how they secured so many live apes; he said by taking a large gourd which grew here. In this a small hole is cut so the ape can get his empty hand in; inside as a bait is put some boiled rice and molasses; with the hole on top, the gourd is fastened to a log or stump. The hunter with hundreds of little eyes peering from hiding places is closely watched as he pushes his fingers into the hole and pretends to eat. He now goes away to hide and as he goes he is followed by all kinds of voices derisive and otherwise. After awhile a bold little fellow will venture to smell at the gourd and immediately go back to his mates and seemingly hold a consultation. Some time will elapse and several will visit the trap and one will push his hand in and grasp it full of the bait, so full he cannot pull it out of the small hole. Then a screaming is heard and the hunter is on hand and puts him in a bag. It is seldom they trap a female, probably being too timid to try it.

Getting short of water our long boat was filled with water casks, and with Job as a pilot, the second mate, two men and myself, with a lug sail hoisted, started for the opposite side of the river, about seven miles away. As we neared the land the water was shoal, some places not more than a fathom deep, with old logs and trees fast in the tall weeds growing under water. Some of these logs were covered with mossback turtles, with now and then an alligator, which were plentiful about here. We saw streaks of muddy water showing their tracks. Cranes, pelicans and bustards were plentiful. And now we entered a channel, and in between lofty canebrakes, the very canes we use as fishing rods. For a mile and a half we rowed through this stinking stronghold of big black water snakes and alligators. We saw several serpents fully 15 ft. long and 4 or 5 in. in diameter. Also alligators which were fully 10 ft. in length. But everything beat a hasty retreat when we came near. And now we were at the foot of the falls of a small river with its waters fresh, clear and sweet. It was a treat to us to get such a drink. We climbed up the rocks, which were bare of vegetation, and at least 50 ft. high, and such a view! We were in the midst of an immense, almost treeless wilderness, inhabited by nearly everything that runs wild. And from that eminence we could see many sights strange to us, and which could be easily explained by Job. On distant grassy plains we saw large animals of some kind grazing. One of the men found a serpent just like the one I saw. Job said it was harmless and it bounded down the rocks in a hurry and into the canes. After filling our casks and

cutting about 20 canes for fishing rods, we started on our return and got outside of the canebrakes to find the falling tide and loaded boat would not go well together. So for four hours we were delayed, and just as night set in we got over the bar by poling with the oars on the bottom, as the tide setting in had raised the water. In this country, as soon as the sun sets it is dark. The wind now was blowing off the land and down the river as usual; giving us a beam wind to the light hung out on the brig. Busy was the time taking in cargo in one port and discharging ballast out of the other, the sea breeze tempering the sun's heat. On Sunday all work was suspended and the men allowed to go ashore on the wide gravel beach, for into the forest they could not go. The second mate carried with him an old-time, flint-locked horse pistol loaded with shot, and a poor little ape ventured too near and received the charge in its stomach, and such a cry I never heard, except from a baby, and little tears trickled down its cheeks. If it had been a child I as well as the one who shot it could not be more grieved. It spoiled our day. It was a mere baby and looked innocent like one. The woods were swarming with life and some of its denizens were of a dangerous type. At night millions of fire flies were to be seen flitting here and there, and from the vessel when it was very dark it resembled a lighted city. Large flocks of parrots were to be seen at early morn, flying hither and thither; wonderfully beautiful flowers were on every hand and perfumed the air. Nuts and wild fruits were everywhere through this impregnable wilderness. At night we caught large catfish, lobsters and crayfish sufficient to stock a fish peddler. At almost any time sharks could be seen barely moving. It was a month before the last of our cargo was on board. The long boat went again for water, and Capt. Smith with two men went up to the settlement for his bill of lading and such things as we required, also our clearing papers. Yards and masts were sent aloft. The long boat was placed in the chocks and the jolly boat was put inside of her. The chain grappes formed a firm lashing for both, then on each side of the boats the spare spars were lashed, with a tier of casks of water on each side. The vessel was so full that our half deck was very small, with just room for our three hammocks and chests. I was ever fearful of scorpions and centipedes, as many of the sticks of logwood were hollow and were good hiding places for such. And, although I knew that every stick had been put in the box of water in order to get the solid contents of the wood, I still had fear; and my fear was not unfounded, for one night I swung into my hammock and I knew no more for some time, for I had sprung up with such force, my head striking a deck beam, that I fell senseless on the chests. The carpenter saw me fall and supposed the hammock had thrown me. When I regained consciousness I found the mate and carpenter rubbing my body asking me why I fell. I pointed to the hammock saying a snake was there. With a lamp they searched and found a lizard about a foot long. One of the men who had been many times through these waters pronounced it harmless and took it in his hand. The boys laughed, but I noticed they all searched their beds ere they got in. Nothing was ever seen after this to create alarm. We had many specimens of zoology on board. Our steward had two marmozettes in the steerage. They were in size like a medium sized cat; all around the face were silky white whiskers and with their little black nose and eyes were comical to be sure. We are under and our course was through the Yucatan channel and through the Gulf stream. We were several days out and were eating dinner, and but a light breeze and no land was in sight.

One of the men looking over the bows reported foul water, meaning by this that he could see rocks under the bottom of the ship. All hands were on deck in a minute and the vessel put about, but she was slow in stays, the wind being light. Just as the head sails got aback she struck heavily, but did not stop. Looking at the bottom we found she was drifting to the north a good two knots per hour; again she struck but kept going. All off to the southward, the water was a light pea green, showing the shallow water. As we drifted a man in the main chains constantly hove the lead, and happy were we when the leadsmen spoke, and a half hour, and the next east 20 fathoms, no bottom. "Go below the watch." This was done, but we had a cold dinner. It seemed queer to me the rocks so near our bottom, and the land so far out of sight. Never on this voyage yet had we seen a steamer nor had we spoken to any vessel except the Hope, though we saw at a long distance several sailing vessels. Getting a good breeze at west with top lower and top gallant studding sails set we were soon passing between Yucatan and Cuba; we took this course to gain the benefit of the current of the Gulf stream. The wind now shifted to the northeast, but the current being under our lee assisted us greatly in working to windward. We made one stretch and fetched so close to Morro Castle, Havana, that we could see the flag pole. Whilst beating through on a dark dismal night she struck the bottom heavily and was put about. The lead was cast but no bottom was found. Her standing keel saved her bottom. In abaft the cabin was a large sail locker filled with spare sails; between the mates' and master's state rooms and sail locker were small windows for air. In the locker was a long copper funnel; in cold weather it was attached to the cabin stove to carry off the smoke. The steward's marmozettes played through this smoke-begrimed funnel, and black they were; and then they rolled on the captain's fine white counterpane and pillows, and soiled they were. Capt. Smith had often seen them there and never offered objections; but now he caught one by the leg and dashed it on the floor, killing it. After throwing it overboard the other one grieved, and would not eat, and so died. The steward entered a suit, and was awarded £5 when we arrived home on the plea that no objections were offered against their presence in the cabin. Two of the apes and a parrot died. We were well nigh half seas over, and a very heavy roll from the southwest denoting fierce wind from that direction, and it came with a vengeance. Fearing to broach to, with a close-reefed main topsail, a balance reefed main trysail and fore topmast staysail she was brought to the wind and hove to, her helm lashed a-lee. The royal masts and yards had been sent down on account of the reading of the barometer. On the lakes a vessel to save herself must scud, but there a sea will strike under the counters or stern, and lifting the rudder out of the water, broach to, and maybe dismast the vessel. The wind raised and a tremendous sea was running. For four days the Falcon labored in this tempest. Nothing could be cooked. For all the sea, a green sea never got over the rail of our little ship of 700 tons register. I never was on a vessel in my 56 years' experience that could equal her when hove to. Now all these four days the wind was fair, but we dared not let her scud. Under our stern were constantly flying little birds called by the sailors Mother Carey's chickens; they look like little swallows. Gradually the sea and wind went down and shifted, inasmuch as the vessel was heading her course and carrying whole topsails and courses, a reefed trysail, fore topmast staysail, and standing jib, and going three points free and logging eight knots per hour. But

now commenced a time I shall not forget. The water barrels parted their lashings during the gale, and by the motion of the vessel were stove in and the water escaped, leaving us one barrel in the forecastle and two which were between the spare spars and under the long boat's bows. At Savanna we could not get one pound of meat or bread. There people ate a kind of bread made of maize called casava, which turns sour in a day or two. We got several bags of rice, but we were now put on short allowance of water so that we could not cook rice. Only think half a pint a day to each and every man aboard. And what made it worse, the wind canted round to the northeast, and almost ahead. We had several gallon cans of oxtail soup; the galley kettles were filled with sea water and the cans put in and fetched to a boil; the meat and vegetables were taken out and the can was nearly filled with rice. Three tablespoonsful of this every day as long as it lasted was each man's share. We had a barrel of lime juice and another of sugar and we mixed some in a beef kid and put in it a lot of uncooked rice; this swelled and was nutritious as far as it went. Our bread was weevily, musty and past human food, but the men broke it up fine with a hammer for the apes and parrots, and short though the men were, they spared a few drops of water, also a few grains of rice. It was with a strong southerly wind we reached deep sea soundings in the chops of the English channel and without a mouthful of anything to eat or drink. Our mouths were parched and dry. In 40 hours after sounding we sighted a pilot boat and hoisted the union jack at the fore royal masthead for a pilot. The boat run us close aboard and as the dinky came alongside, for we were hove to, the captain had an order ready and a brief statement, which he handed to the pilot asking him also to fetch two fresh men as we were so weak that it took two men to hand the royals and every man to brace round the yards. Excitement causes wonderful things to transpire at times. Not a man on our vessel asked the pilots for a drink. For my part I did not just then suffer from hunger or thirst, but the German fainted away and dropped on the main hatch. In about three hours the boat sailed out again with two sailor men and a Cornish miner. As quick as a water cask was landed on deck it was stood on end and an ax put through the head, the captain and every man filled up their cans and drank, vomiting and drinking until sated partly. Then 20 loaves of bread were soon demolished. It seemed that we could not get enough. And now our cook was at work again. In the meantime the brig with all sails, except studding sails set, was traveling lively through the English channel and to London, but before reaching that point we were overhauled by quarantine officers who placed us into Stangate creek, where Lord Nelson's battleship hulks were moored and at that time quarantine ground. So weakly was our appearance, we were there eight days, which were the best times we had during the voyage. And now being safely moored in the St. Catherines dock, London, all hands were paid off, excepting the master, mate and two apprentices. We sent down all the yards and masts, even housing the topmasts, so sharp and crank was she except when in ballast or loaded. Barnacles were in plenty on her bottom. So now I end my first voyage at sea.

Since that time I made a voyage to Rhodes Island and Smyrna, one to Archangel in the White Sea, Russia, one to Greenland after whales, one to Tatmagouche in New Brunswick, and out to Quebec, where I left the barque Chance and came on these great North American lakes and here I've been ever since—over 50 years.

DESTRUCTION OF A FAMOUS VESSEL

In the destruction of the schooner V. H. Ketchum by fire off Parisian Island, Lake Superior, last week, one of the famous vessels of the great lakes passed away. Thirty years ago the Ketchum, launched as a steamer, was regarded as the greatest wonder on the lakes, being at that time the largest vessel afloat and considered by many as altogether too big for great lakes trade. The cause of the fire is not known. The Ketchum was laden with iron ore and was bound from Duluth to Cleveland in tow of the steamer Nottingham. The fire was first discovered in the after cabin and made such headway that it was soon beyond control. The schooner was immediately headed for shore and beached in 23 ft. of water, where she burned to the water's edge. Two lives were lost. When it was seen that the schooner was doomed the members of the crew took to the lifeboat. In attempting to lower the woman cook into the small boat it was capsized and the eight men were thrown into the water. In the struggle to save themselves, the woman was temporarily forgotten when Andrew Anderson, the mate, struck out after her. He succeeded in reaching her before she sank, but was unable to maintain her above water until the boats from the Nottingham could reach them. They were both drowned. The history of the V. H. Ketchum was published in the *Marine Review* of June 9, 1904, and is reproduced as follows:

"The steamer V. H. Ketchum was at the time she was built the largest cargo carrier on the lakes. She was 223 ft. keel, 41 ft. beam and 16 ft. deep. When she was launched at the yard of David Lester, Marine City, Mich., in 1874, people came from all over the state to see what they called the 'floating island' slide into the water. The Ketchum was equipped with four spars, all carrying sails, and also staysail. Owing to the conditions of the docks and the poor facilities for handling the cargo of this 'floating island' at both ends of the route she was far from being a profitable investment and sold after being run three seasons for \$65,000. Meanwhile, however, the facilities for handling her cargo on the docks were becoming better and better and she finally became so profitable a carrier that she has the reputation of laying the foundation of several fortunes. When she first came out there were no facilities whatever for loading coal, it being wheeled aboard in barrows, a very tedious operation. Wood was principally used for fuel on her trips, only fifty tons of coal being consumed from Chicago to Buffalo. She carried about 36 lbs. of steam. The Ketchum was built for the Toledo & Saginaw Transportation Co., and of the original stockholders all have passed away except M. Morris, of Toledo, Capt. Thomas Lester, of Marine City, W. S. Brainard, of Toledo, and A. Gebhart, of Dayton, who was the president of the company. The Ketchum was sold in 1878 to Adam & Delemeter, of Cleveland, and later to Mr. Frank Seither, of Cleveland.

"Many changes have been made in the Ketchum since she was launched, but the greatest of them all was made last winter when her owners sent her to the yard of Abram Smith & Son, Algonac, Mich., and not only had her converted into a schooner but caused her to be rebuilt from the light water mark up. As a schooner she has three additional hatches, steam steerers and every equipment to make her a modern consort. Her machinery was installed in the steel steamer R. W. England, recently launched from the yard of the Great Lakes Engineering Works, Detroit, Mich."

RUSSIAN CRUISER LENA SAILED

The Russian cruiser Lena, whose arrival in the port of San Francisco many months ago caused such a great diplomatic flutter between the governments of the United States, Japan and Russia, will very soon sail from the Mare Island naval station direct for Vladivostok. This was at once decided, upon the conclusion of peace terms between Japan and

Russia. Since arriving at San Francisco, the Lena has been lying idle at Mare Island, all her guns having been dismantled. Before steaming away, the Lena has been repaired, repainted, and the vessel docked. All her guns and ammunition that were safely stored at Mare Island arsenal were restored to the cruiser.

NEW AID TO NAVIGATION

Construction work has just begun on a new aid to navigation in the far northern waters of British Columbia which will be of the greatest possible benefit to northern shipping of both the American and Canadian flag. The light is being placed on Green Island, inside upper Dundas Island, off Port Simpson, and in the direct path of vessels plying between Skagway and southern coast points. It was on this island that the steam collier Bristol was wrecked with deplorable loss of human life on Jan. 2, 1907.

PERSONAL

Mr. George L. Craig, of the Craig Ship Building Co., Toledo, was in New York last week.

Mr. B. J. Clergue, of the Lake Superior Corporation, Sault Ste. Marie, Ont., is in England.

Gardiner C. Sims, formerly of Armington & Sims, Providence, R. I., is now general manager of the Marine Engine & Machine Co., 120 Liberty street, this city, and Harrison, N. J.

Mr. E. F. Leeds of the Leeds Marine Equipment Co., of Bridgeport, Conn., was recently married and has just sailed for Europe on his wedding trip. He will probably be gone for some time.

OBITUARY

Harry M. King, chief engineer of the Lehigh Valley liner Bethlehem, died suddenly at his home in Buffalo last week.

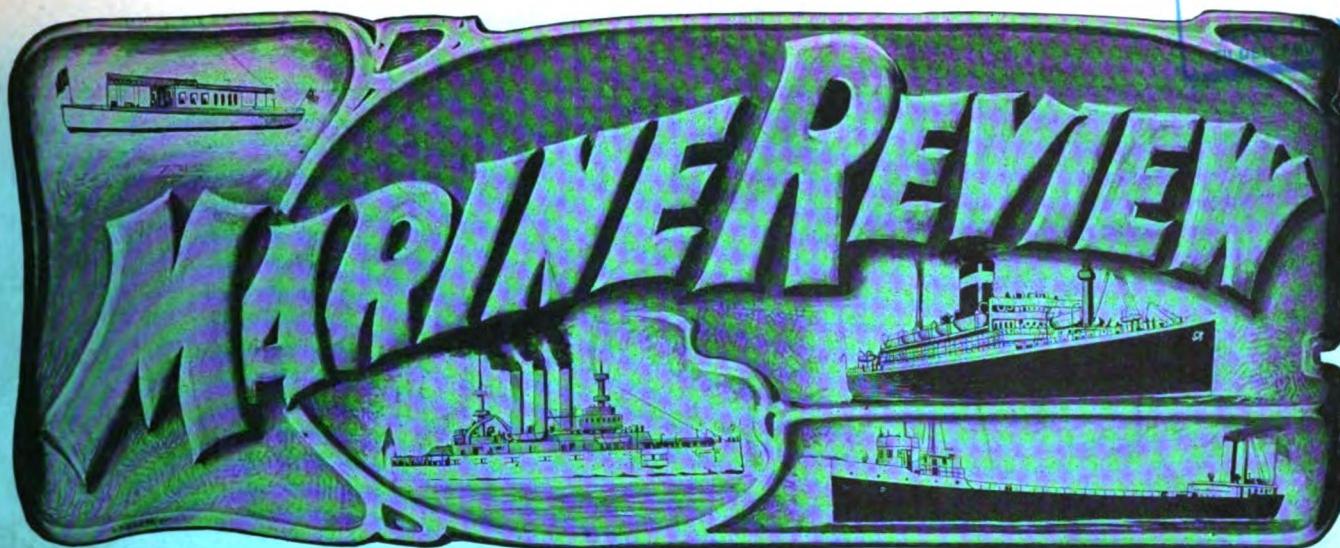
Capt. H. S. Read, formerly a well known lake captain, died at his home in Ludington last week. He was sixty-eight years old.

Capt. Stephen E. Chatterton, for more than thirty years a well known figure on the great lakes, died at Mercy Hospital, Chicago, last week. He had sailed various steamers of the Anchor Line.

John B. Holden, veteran marine engineer of Buffalo and for many years in the Anchor line, died at his home Aug. 24. He was at one time connected with the lighthouse service as engineer on one of the tenders.

A successful experiment of unusual importance to the marine engineering world has just been had with the new channel steamer Dieppe which has recently been built by the London, Bright & South Coast Co., in association with the Western Railway of France. Before letting the contract these two companies imposed exceptionally severe conditions in starting and stopping tests to determine accurately the maneuvering qualities of turbine-driven vessels. A clause was placed in the contract requiring that the steamer should pass a certain mark at a given speed and be brought to a state of rest before passing a second mark placed at a specified distance from the first boat. Only one company, the Fairfield Ship Building Co., would undertake the contract. At the acceptance trial two stake boats were moored at a distance of 109 yards and the Dieppe passed the first boat at the specified speed of 12 knots an hour. The turbines were then reversed and the steamer stopped and began to go astern a few yards short of the second stake boat. It is reported that the time taken in coming to a full stop was forty seconds. This would be an excellent performance for any vessel driven by reciprocating engines.

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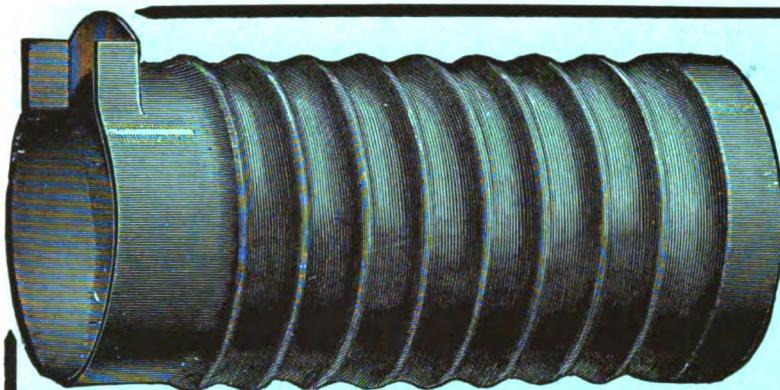
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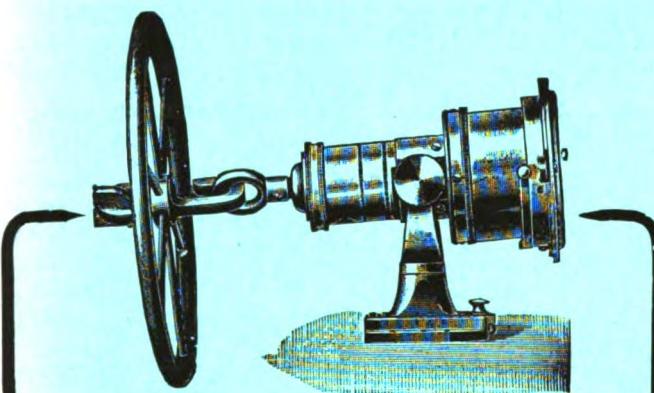
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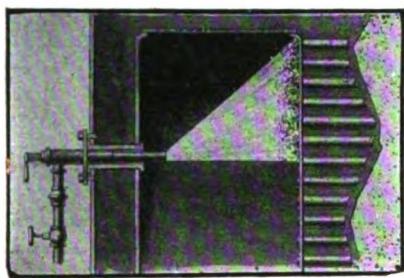
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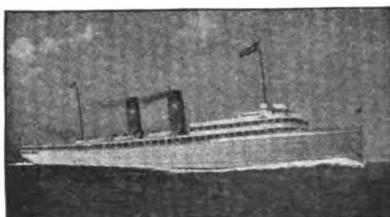
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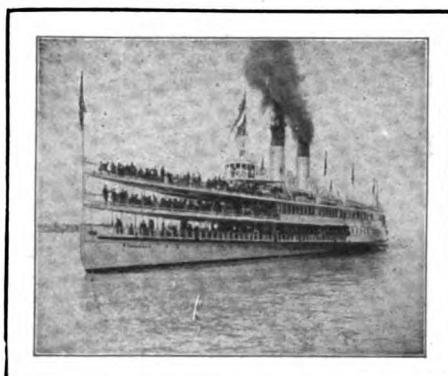
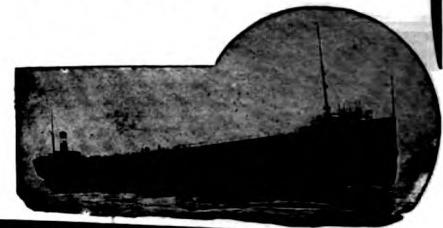
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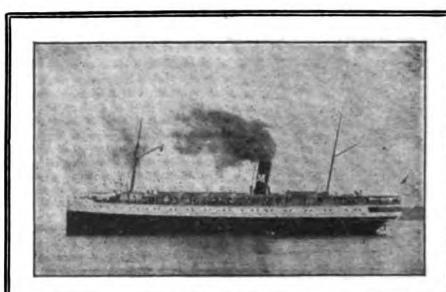
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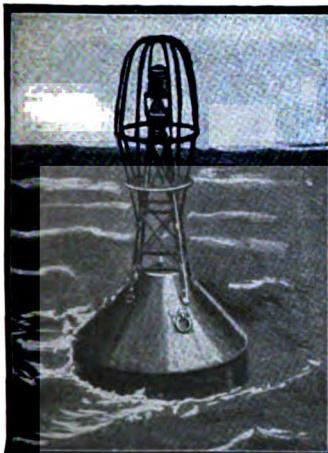
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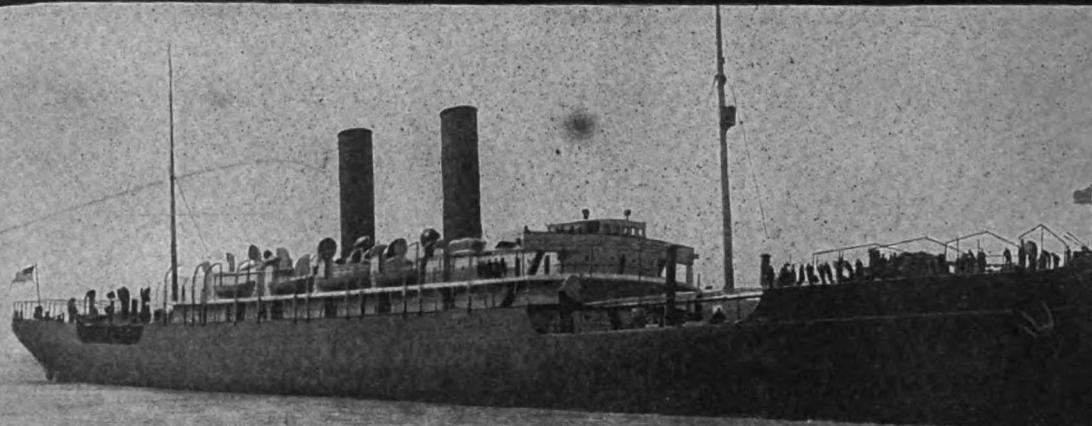
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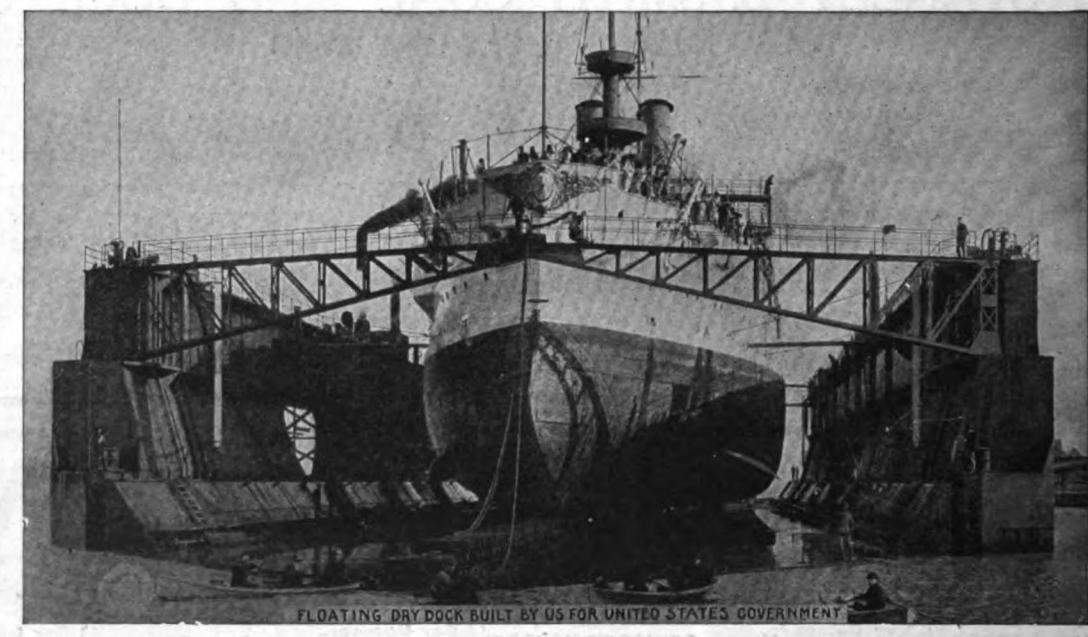
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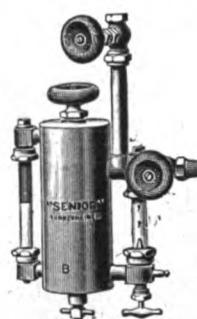
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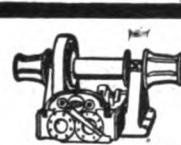
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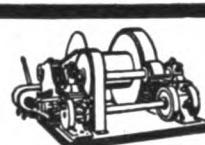
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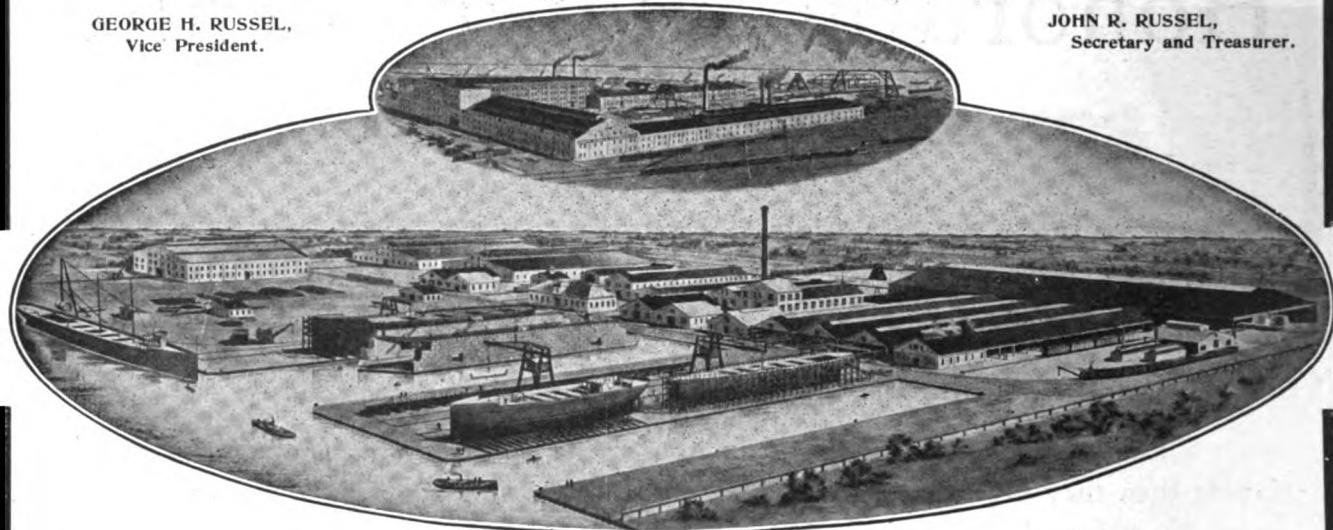
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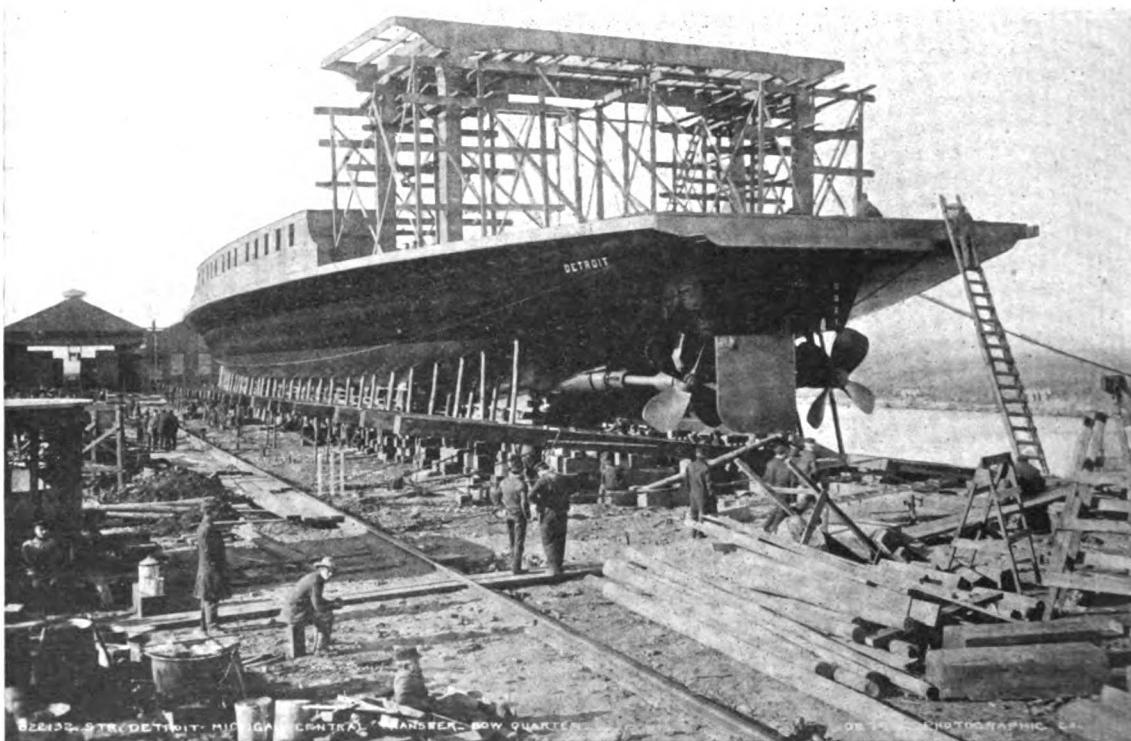
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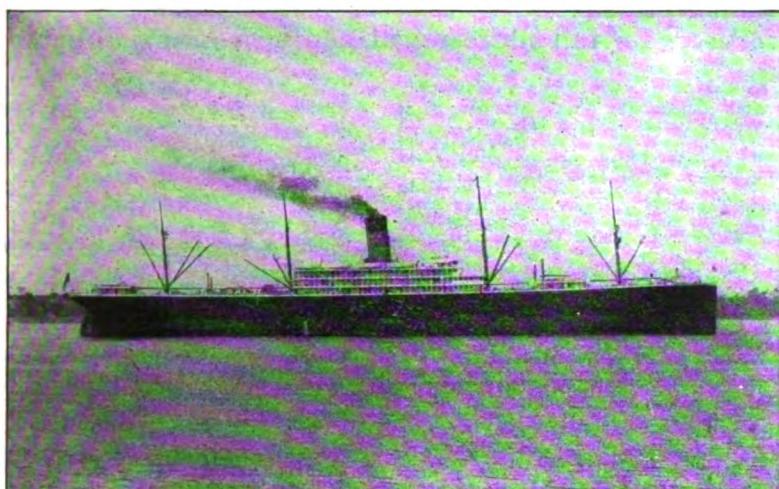


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DIVING APPARATUS.

Morse, A. J. & Son.....Boston.
Schrader's Son, Inc., A. New York.

DRAFT, MECHANICAL.

Sturtevant Co., B. F.....Hyde Park, Mass.

DREDGING CONTRACTORS.

Breymann & Bros., G. H.....Toledo.
Buffalo Dredging Co.....Buffalo.
Dunbar & Sullivan Dredging Co....Buffalo.
Fitz-Simons & Connell Co.....Chicago.
Great Lakes Dredge & Dock Co.....Chicago.
Hickler Bros.....Sault Ste. Marie, Mich.
Hubbell Co., H. W.....Saginaw, Mich.
Lake Superior Contracting & Dredging Co....
.....Duluth, Minn.
Smith Co., L. P. & J. A.....Cleveland.
Starke Dredge & Dock Co., C. H. Milwaukee.
Sullivan, M.....Detroit.

DREDGING MACHINERY.

Quintard Iron Works Co.....New York.

DRYING APPARATUS.

Sturtevant, B. F. Co.....Hyde Park, Mass.

DRY DOCKS.

American Ship Building Co.....Cleveland.
Atlantic Works.....East Boston, Mass.
Buffalo Dry Dock Co.....Buffalo.
Chicago Ship Building Co.....Chicago.
Craig Ship Building Co.....Toledo, O.
Cramp, Wm. & Sons.....Philadelphia.
Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works.....Detroit.
Lockwood Mfg. Co.....East Boston, Mass.
Milwaukee Dry Dock Co.....Milwaukee.
Newport News Ship Building Co.....
.....Newport News, Va.
Shipowners Dry Dock Co.....Chicago.
Superior Ship Building Co.....Superior, Wis.
Tietjen & Lang Dry Dock Co....Hoboken, N. J.

DREDGE BUILDERS.

Manitowoc Dry Dock Co.....Manitowoc, Wis.

DYNAMOS.

General Electric Co.....Schenectady, N. Y.
Mietz, Aug.....New York.
Sturtevant, B. F. & Co.....Hyde Park, Mass.
Thropp & Sons, John E.....Trenton, N. J.

ECONOMIZERS, FUEL.

Sturtevant Co., B. F.....Hyde Park, Mass.

ELECTRIC HOISTS AND CRANES.

General Electric Co.....Schenectady, N. Y.

WANTED and FOR SALE Department.

PROPOSALS.

U. S. ENGINEER OFFICE, 57 Park St., Grand Rapids, Mich., Sept. 4, 1905. Sealed proposals for extension of Piers at Holland (Black Lake), Mich., will be received here until 3 p.m., October 4, 1905, and then publicly opened. Information furnished on application. M. B. ADAMS, Col. Engrs. Sept. 28

U. S. ENGINEER OFFICE, 57 Park St., Grand Rapids, Mich., Sept. 11, 1905. Sealed proposals for construction and repair of piers at Muskegon, Mich., will be received here until 3 p.m., Oct. 11, 1905, and then publicly opened. Information furnished on application. M. B. ADAMS, Col. Engrs. Oct. 5

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FOR SALE.

STEAMER "GEORGE T. HOPE."
1558 Tons.

Can be seen at Cleveland.

Sealed bids will be received for the sale of this vessel by George L. McCurdy, Agent, 169 Jackson Boulevard, Chicago, Ill. Bids will be opened Sept. 28, at 2 p.m. The right is reserved to reject any or all bids.

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FOR SALE.

FOR SALE \$3500.00.

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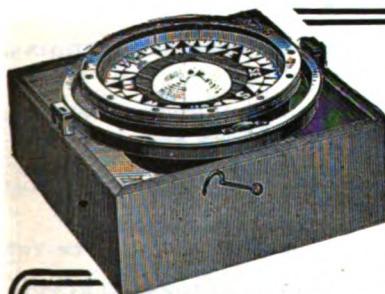
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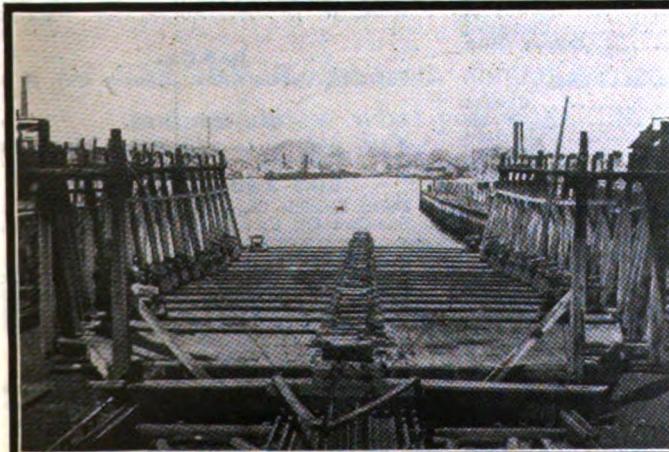


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Mietz, Aug.New York
Sturtevant, B. F. & Co.....Hyde Park, Mass.
Thropp & Sons, John E.....Trenton, N. J.

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American Ship Building Co.....Cleveland.
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Chicago Ship Building Co.....Chicago.
Chase Machine Co.....Cleveland.
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Detroit Ship Building Co.....Detroit.
Fletcher, W. & A. Co.....Hoboken, N. J.
Fore River Shipbuilding Co.....Quincy, Mass.
Great Lakes Engineering Works.....Detroit, Mich.
Hall Bros.....Philadelphia.
Lockwood Mfg. Co.....East Boston, Mass.
Marine Iron Works.....Chicago.
Maryland Steel Co.....Sparrows Point, Md.
Mietz, Aug.New York
Milwaukee Dry Dock Co.....Milwaukee.
Mosher, Chas. D.....New York.
Moulton Steering Engine Co.....New York.
Newport News Ship Building Co.....Newport News, Va.
New York Shipbuilding Co.....Camden, N. J.
Northwestern Steam Boiler & Mfg. Co.....Duluth, Mich.
Quintard Iron Works Co.....New York.
Koach's Ship Yard.....Chester, Pa.
Sheriffs Mfg. Co.....Milwaukee.
Superior Ship Building Co.....Superior, Wis.
Thropp, J. E. & Sons Co.....Trenton, N. J.
Trout, H. G.....Buffalo.

ENGINE BUILDERS, STEAM.

Sturtevant Co., B. F.....Hyde Park, Mass.

ENGINE ROOM TELEGRAPH, CALL BELLS, ETC.

Cory, Chas. & Son.....New York.
Marine Mfg. Supply Co.....New York.

ENGINE TESTING.

Parsons, Ralph M.....Chicago.

ENGINEERING SPECIALTIES AND SUPPLIES.

Crane Co.....Chicago.
Kieley & Mueller.....New York.
Lunkenheimer Co.....Cincinnati.
Northwestern Steam Boiler & Mfg. Co.....Duluth, Minn.

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Hynd, AlexanderCleveland.
Hunt, Robt. W. & Co.....Chicago.
Kidd, JosephDuluth, Minn.
Kidd, JosephDuluth, Minn.
Mosher, Chas. D.....New York.
Nacey, JamesCleveland.
Roelker, H. B.New York.
Wood, W. J.Chicago.

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Sturtevant, B. F. Co.....Hyde Park, Mass.

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Greacen-Derby Engineering Co.....Perth Amboy, N. J.
Ross Valve Co.....Troy, N. Y.

FIRE EXTINGUISHERS.

Safety Fire Extinguisher Co.....New York.

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General Electric Co.....Schenectady, N. Y.

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Sturtevant, B. F. Co.....Boston.
Sutton Co., C. E.....Toledo, O.

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Cleveland City Forge & Iron Co.....Cleveland.
Fore River Shipbuilding Co.....Quincy, Mass.
Macbeth Iron Co.....Cleveland.

FLUE WELDING.

Pix's, S. Sons.....Cleveland.

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Sturtevant Co., B. F.....Hyde Park, Mass.

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Ironville Dock & Coal Co.....Toledo, O.
Parker Bros. Co., Ltd.....Detroit.
Pickands, Mather & Co.....Cleveland.
Pittsburg Coal Co.....Cleveland.
Smith, Stanley B., & Co.....Detroit.
Smith Coal & Dock Co., Stanley B. Toledo, O.

FUELING PLANTS, BUILDERS OF

Link Belt Machinery Co.....Chicago.

FURNACES FOR BOILERS.

Continental Iron Works.....New York.

GAS BUOYS.

Safety Car Heating & Lighting Co.....New York.

GAS AND GASOLINE ENGINES.

Chase Machine Co.....Cleveland.

GAUGES, STEAM AND VACUUM.

Ashton Valve Co.....Boston.
Lunkenheimer Co.....Cincinnati.

GAUGES, WATER.

Bonner Co., Wm. T.....Boston.

Lunkenheimer Co.....Cincinnati, O.

GENERATING SETS.

Sturtevant Co., B. F.....Hyde Park, Mass.

General Electric Co.....Schenectady, N. Y.

GRAPHITE.

Dixon Crucible Co., Joseph.....Jersey City, N. J.

GREASE EXTRACTORS.

Greacen-Derby Engineering Co.....Perth Amboy, N. J.

HAMMERS, STEAM.

Chase Machine Co.....Cleveland.

HEATING APPARATUS.

Sturtevant, B. F. Co.....Hyde Park, Mass.

Sutton Co., C. E.....Toledo, O.

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American Ship Building Co.....Cleveland.

Brown Hoisting Machinery Co. (Inc.)....Cleveland.

Chase Machine Co.....Cleveland.

General Electric Co.....New York.

Georgian Bay Engineering Works.....Midland, Ont.

Hyde Windlass Co.....Bath, Me.

McMyler Mfg. Co.....Cleveland.

Marine Iron Co.....Bay City.

Mietz, Aug.New York.

HOLLOW SHAFTINGS, IRON OR STEEL.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

HOLLOW STAYBOLT IRON.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.

HYDRAULIC DREDGES.

Great Lakes Engineering Works.....Detroit.

HYDRAULIC TOOLS.

Watson-Stillman Co., The.....New York.

ICE MACHINERY.

Great Lakes Engineering Works.....Detroit.

Roelker, H. B.....New York.

INDICATORS FOR STEAM ENGINES.

Ashton Valve Co.....Boston.

INJECTORS.

American Injector Co.....Detroit.

Crane Co.....Chicago.

Jenkins Bros.New York.

Lunkenheimer Co.Cincinnati.

Penberthy Injector Co.....Detroit, Mich.

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Fleming & Co., E. J.....Chicago.

Gilchrist & Co., C. P.....Cleveland.

Hawgood & Co., W. A.....Cleveland.

Helm & Co., D. T.....Duluth.

Hutchinson & Co.Cleveland.

McCarthy, T. R.....Montreal.

McCurdy, Geo. L.....Chicago.

Mitchell & Co.Cleveland.

Parker Bros. Co., Ltd.....Detroit.

Peck, Chas. E. & W. F. New York & Chicago.

Prindiville & Co.....Chicago.

Richardson, W. C.....Cleveland.

Sullivan, D. & Co.....Chicago.

IRON CASTINGS.

Sutton Co., C. E.....Toledo, O.

IRON ORE AND PIG IRON.

Bourne-Fuller Co.....Cleveland, O.

Hanna, M. A. & Co.....Cleveland.

Pickands, Mather & Co.....Cleveland.

LAUNCHES—STEAM, NAPHTHA, ELECTRIC.

Marine Iron Works.....Chicago.

Truscott Boat Mfg. Co.....St. Joseph, Mich.

LIFE PRESERVERS, LIFE BOATS, BUOYS.

Armstrong, Cork Co.....Pittsburg.

Drein, Thos. & Son.....Wilmington, Del.

Gaynor, T. F.New York.

Kahnweiler's Sons, D.New York.

National Cork Co.....Brooklyn.

LIGHTS, SIDE AND SIGNAL.

Russell & WatsonBuffalo.

LOGS.

Nicholson Ship Log Co.....Cleveland.

Walker & Sons, Thomas.....Birmingham, Eng.

Also Ship Chandlers.

LUBRICATING GRAPHITE.

Dixon Crucible Co., Joseph.....Jersey City, N. J.

LUBRICATORS.

Crane Co.....Chicago.

Lunkenheimer Co.Cincinnati.

LUMBER.

Martin-Barriss Co.....Cleveland.

Rayner, J.Chicago.

MACHINISTS.

Chase Machine Co.....Cleveland.

Hickler Bros.Sault Ste. Marie, Mich.

Lockwood Mfg. Co.....East Boston, Mass.

MACHINE TOOLS (WOOD WORKING).

Atlantic Works, Inc.....Philadelphia.

MARINE RAILWAYS.

Hickler Bros.Sault Ste. Marie, Mich.

MARINE RAILWAYS, BUILDERS OF.

Crandall & Son, H. I.East Boston, Mass.

MATTRESSES, CUSHIONS, BEDDING.

Fogg, M. W.New York.

MECHANICAL DRAFT FOR BOILERS.

American Ship Building Co.....Cleveland.

Detroit Ship Building Co.....Detroit.

Great Lakes Engineering Works.....Detroit.

Sturtevant, B. F. Co.....Hyde Park, Mass.

METALLIC PACKING.

Katzenstein, L. & Co.....New York.

MOTORS, GENERATORS—ELECTRIC

General Electric Co.....Schenectady, N. Y.

Sturtevant, B. F. Co.....Hyde Park, Mass.

NAUTICAL INSTRUMENTS.

Ritchie, E. S. & Sons.....Brookline, Mass.

NAVAL ARCHITECTS.

Hynd, AlexanderCleveland.

Kidd, JosephDuluth, Minn.

Mosher, Chas. D.....New York.

Nacey, JamesCleveland.

Wood, W. J.Chicago.

OAKUM.

Stratford, Oakum Co.....Jersey City, N. J.

OIL ENGINES.

Mietz, Aug.New York.

OILS AND LUBRICANTS.

Dixon Crucible Co., Joseph.....Jersey City, N. J.

Standard Oil Co.....Cleveland.

PACKING.

Crane Co.Chicago.

Jenkins Bros.New York.

Katzenstein, L. & Co.New York.

PAINTS.

Baker, Howard H. & Co.....Buffalo.

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- Coal movement of the Great Lakes.
- Gas and gasoline engine builders of the United States.
- Iron furnaces and steel works, lists of.
- Iron mines of Minnesota, map of.
- Iron mining companies, Lake Superior region, addresses of mines, owners, sales agents, etc.
- Iron mining industry, Lake Superior region.
- Iron mining ranges of Lake Superior, map of.
- Iron ore analyses.
- Iron ore carriers, capacities.
- Iron ore, output from Lake Superior by mines and ranges.
- Iron ore, receipts at Lake Erie docks and shipments to furnaces.
- Iron ore shipping docks, particulars of.
- Iron ore sales agents handling Lake Superior product.
- Pig iron production in the United States.
- Pig iron, world's production of.
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- Steel and iron manufacturers of the United States.
- Steel rails and open hearth steel, production of.
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 Hubbell Co., H. W. Saginaw, Mich.
 Lake Superior Contracting & Dredging Co.
 Parker Bros. Co., Ltd. Duluth, Minn.
 Smith Co., L. P. & J. A. Cleveland.
 Starke Dredge & Dock Co., C. H. Milwaukee.
 Sullivan, M. Detroit

PIPE, WROUGHT IRON.

Bourne-Fuller Co. Cleveland, O.
 Crane Co. Chicago.
 Macbeth Iron Co. Cleveland.
 Reading Iron Co. Reading, Pa.

PLANING MILL MACHINERY.

Atlantic Works, Inc. Philadelphia.

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Kieley & Mueller New York.
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American Ship Building Co. Cleveland.
 Atlantic Works East Boston, Mass.
 Cramp, Wm. & Sons. Philadelphia.
 Detroit Ship Building Co. Detroit.
 Fore River Shipbuilding Co. Quincy, Mass.
 Great Lakes Engineering Works Detroit.
 Hyde Windlass Co. Bath, Me.
 Lockwood Mfg. Co. East Boston, Mass.
 Marine Iron Works Chicago.
 Milwaukee Dry Dock Co. Milwaukee.
 Newport News Ship Building Co. Newport News, Va.
 Roelker, H. B. New York.
 Sheriffs Mfg. Co. Milwaukee.
 Superior Ship Building Co. Superior, Wis.
 Thropp & Sons Co., J. E. Trenton, N. J.
 Trout, H. G. Buffalo.

PROJECTORS, ELECTRIC.

General Electric Co. Schenectady, N. Y.

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 Marine Iron Works Chicago.
 Kingsford Foundry & Machine Works Oswego, N. Y.

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RANGES.

Stamford Foundry Co. Stamford, Conn.

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 Roelker, H. B. New York.

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Bourne-Fuller Co. Cleveland, O.

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 Crane Co. Chicago.
 Lunkenheimer Co. Cincinnati.

SAIL MAKERS.

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SALVAGE COMPANIES.

See Wrecking Companies.

SEARCH LIGHTS.

General Electric Co. Schenectady, N. Y.

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Falls Hollow Staybolt Co. Cuyahoga Falls, O.

SHEARS.

See Punches, and Shears.

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 Craig Ship Building Co. Toledo, O.
 Chicago Ship Building Co. Chicago.
 Detroit Ship Building Co. Detroit.
 Fore River Shipbuilding Co. Quincy, Mass.
 Great Lakes Engineering Works Detroit.
 Lockwood Mfg. Co. East Boston, Mass.
 Manitowoc Dry Dock Co. Manitowoc, Wis.
 Maryland Steel Co. Sparrows Point, Md.
 Milwaukee Dry Dock Co. Milwaukee.
 Newport News Ship Building Co. Newport News, Va.
 New York Shipbuilding Co. Camden, N. J.
 Roach's Ship Yard Chester, Pa.
 Shipowner's Dry Dock Co. Chicago.
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 Marine Mfg. & Supply Co. New York.
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SHIP DESIGNERS.

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 Steel, Nacey & Hynd Cleveland.
 Wood, W. J. Chicago.

SHIP LANTERNS AND LAMPS.

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 Boston Steamship Co. Boston.
 Cleveland & Buffalo Transit Co. Cleveland.
 International Mercantile Marine Co. Philadelphia.
 Mallory Line New York.
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 Red Star Line New York.
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STEEL CASTINGS.

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 Sutton Co., C. E. Toledo, O.

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 Chase Machine Co. Cleveland.
 Detroit Ship Building Co. Detroit.
 Hyde Windlass Co. Bath, Me.
 Marine Mfg. & Supply Co. New York.
 Moulton Steering Engine Co. New York.
 Sheriffs Mfg. Co. Milwaukee.

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Gaskin, Edward Buffalo.
 Hynd, Alexander Cleveland.
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 Nacey, James Cleveland.
 Steel, Adam Cleveland.
 Wood, W. J. Chicago.

TESTS OF MATERIALS.

Hunt, Robert W. & Co. Chicago.
 Lunkenheimer Co. Cincinnati, O.

TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.

Watson-Stillman Co. New York.

TOOLS, WOOD WORKING.

Atlantic Works, Inc. Philadelphia.

TOWING MACHINES.

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 Chase Machine Co. Cleveland.

TOWING COMPANIES.

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Kieley & Mueller New York.
 Sturtevant Co., B. F. Hyde Park, Mass.

TRUCKS.

Boston & Lockport Block Co. Boston.

TUBING, SEAMLESS.

Shelby Steel Tube Co. Pittsburgh, Pa.

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 Crane Co. Chicago.
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 Kieley & Mueller New York.
 Lunkenheimer Co. Cincinnati.
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 Hall, John B. Buffalo.
 Helm & Co., D. T. Duluth.
 Hawgood & Co., W. A. Cleveland.
 Holmes, Samuel New York.
 Hutchinson & Co. Cleveland.
 Lester, S. S. Quebec, Can.
 McCarthy, T. R. Montreal.
 Mitchell & Co. Cleveland.
 Parker Bros. Co., Ltd. Detroit.
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 Sullivan, D. & Co. Chicago.

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 Upson-Walton Co. Cleveland.

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American Ship Windlass Co. Providence, R. I.
 American Ship Building Co. Cleveland.
 Hyde Windlass Co. Bath, Me.
 Marine Mfg. & Supply Co. New York.

WINCHES.

American Ship Windlass Co. Providence, R. I.
 Georgian Bay Engineering Works Midland, Ont.
 Hyde Windlass Co. Bath, Me.

WOOD WORKING MACHINERY.

Atlantic Works, Inc. Philadelphia.

WOODS, FOREIGN.

Rayner, J. Chicago.

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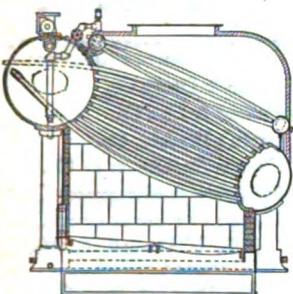
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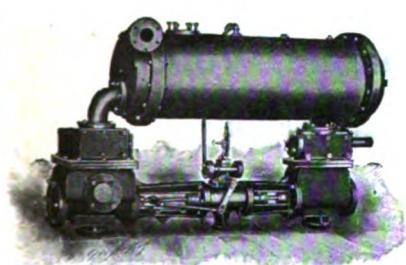
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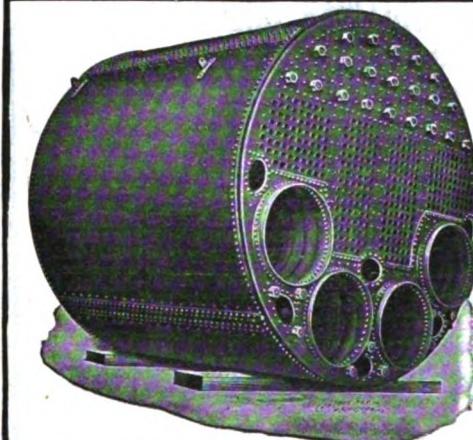
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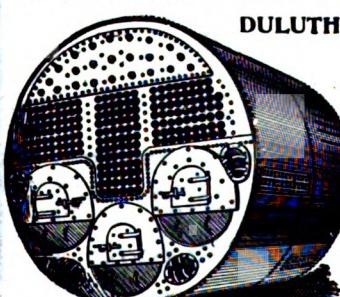
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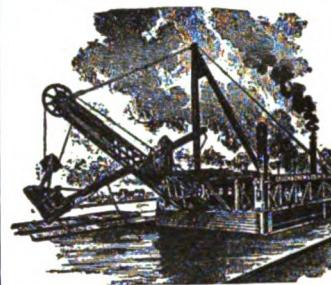
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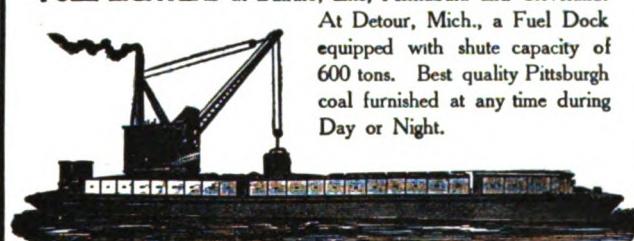
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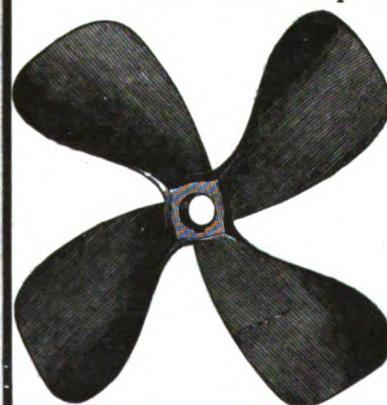
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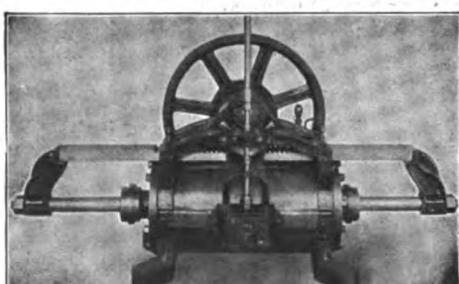


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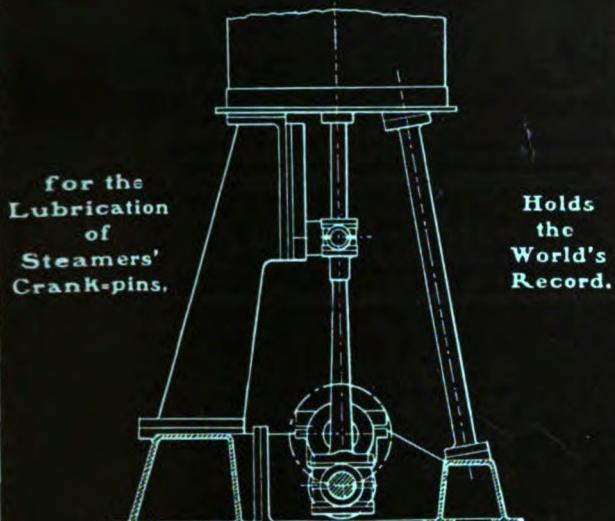
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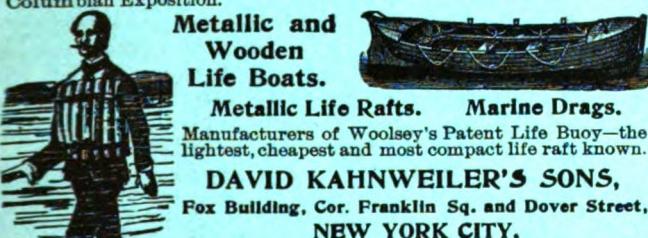
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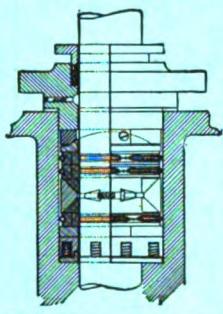


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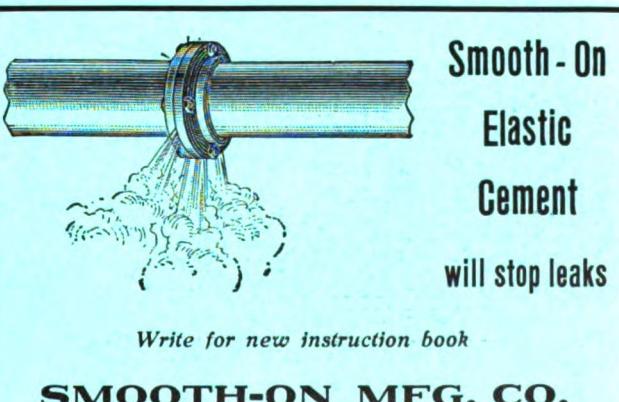


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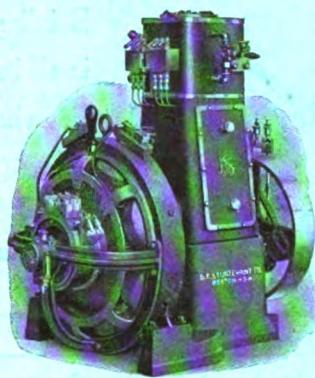
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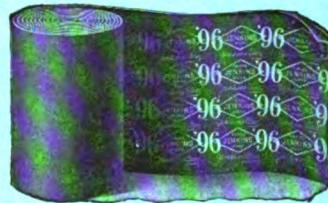
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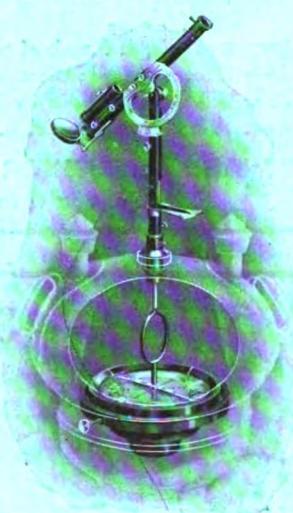
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